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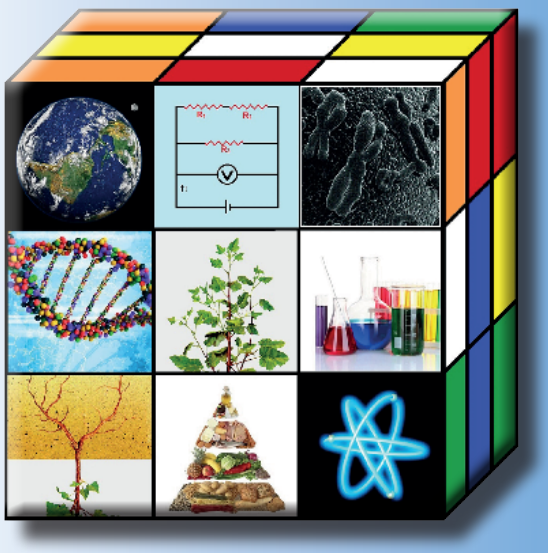

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Technology for Green Energy

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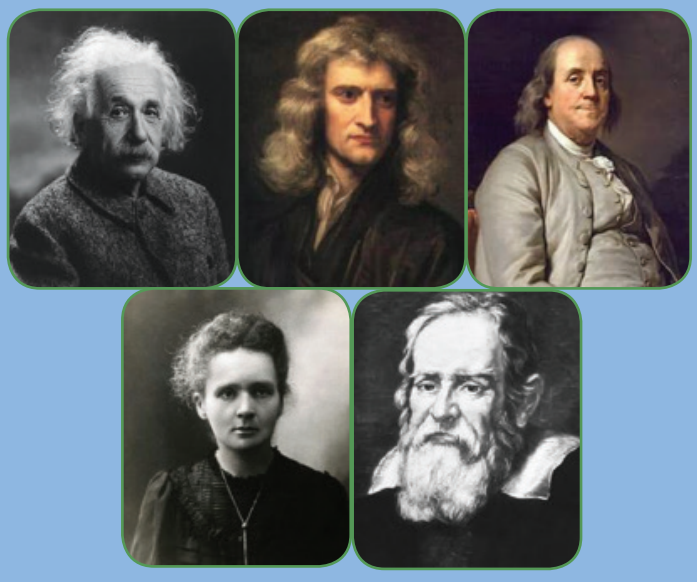


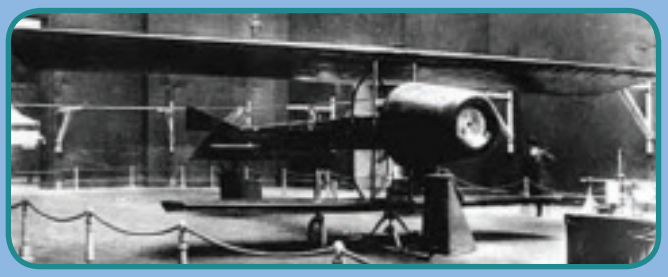

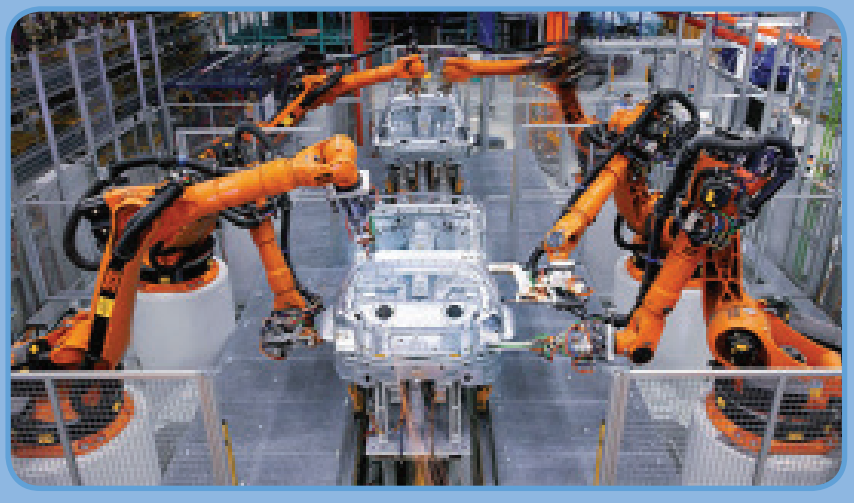

EDITORIAL

Dramatic Progress in Science – Who can follow?

by Nikolaos Chatzarakis
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Dear readers,

Another issue of the magazine is ready – after the usual pressure from everybody towards everybody, which, of course, is part of the beloved bread and butter of an editing team. After all, every work consists of unnumbered difficulties and hurdles. Without them, however, none of the participants would feel and understand the deeper importance and the real impact of his/her work.

This thought is probably bringing in mind other – rather sad – thoughts: there are many people in this world that struggle to achieve something that might never be utilized or be esteemed as it should. Unfortunately, scientific research belongs exactly to this place; the usually dramatic evolutions of its fields are bringing us before huge gaps between our past and our future, which either we cannot pass, thus staying behind, or we can pass them without having full conscience of our steps…

In a recent conversation with a friend of mine, I came across a most unusual opinion, but well established one, though: that the propulsion of all modern achievements of science in the market has caused problems of social coherence, on the one side, as well as is a directing force for the ongoing research, on the other. And, as always, let us have the distinct example of the internet:

From its appearance until today, humanity has accomplished great jumps forward thanks to it. However, a large part of the population (referring to the "developed" countries) still has not the expected familiarity with it. The youngest members of a society tend to be more interested and, as a consequence, use much more the computers and enjoy all their benefits, than the older members – who, even if they do, consider their entanglement with computers a necessary evil. This situation, by its nature alone, can create gaps among different ages or social groups; taking into account the already existing ages gap (among parents and children), I believe we can easily speak of a polarization, we have never seen before, between different age groups, all trying to pull society to a different direction.

On the same hand, when such a great scientific achievement – as the internet – finds its way in almost every house and takes part in our everyday life (always referring to the "developed" countries), the members of the scientific community working on it are usually called upon to solve problems having nothing to do with the real struggle for knowledge production. For example, the greatest amount of computer power – and, consequently, energy – is wasted to preserve information like photographs, videos, music, several shorts of special effects and other useless luxuries used by private webpages, blogs or social networking services members. If the intervention of simple citizens was limited, part of this power could be used on the research of more "serious" problems, such as proteins cartography or medicinal products composition.

Almost half the population of the planet will have connection to the Internet by 2017

Of course, it would, be impossible not to relate social development with scientific progress nowadays; the evolution of our society, either on financial or on cultural aspect, is bound together with the evolution of science. Needless to mention that the development of a population is counted by the cultural level of its members.

Besides, the new technological achievements usually come to improve the life conditions of humanity. For example, there are scientific research programs for more resistant

antiseismic buildings, for safer transport vehicles, for more effective medicines or vaccines. Nanotechnology promises that within a few decades several things that now make our lives difficult will be considered easy and implicit. The better understanding of the nature of matter will allow us to produce tougher or shapely materials with hundreds of uses more easily. The recent examples of graphene (Nobel for Physics 2010) and quasicrystals (Nobel for Chemistry 2011) show exactly the meaning of this point of view.

A monolayer thick graphene membrane is able to hold a cat weighing approximately 3 kilograms

Of course, one could assume that the transitional period we live in does not give us the opportunity to realize the deeper connection of scientific progress and social evolution and that after a few years – when the "unsuitable" generation will leave, let's say - the gaps mentioned before will vanish. At the same time, one could assume the opposite: that science and technology have done huge jumps so far and there is no indication of a pause in their route in the not-so-distant future. The results of this continuous progress would be a continuous enlargement of the gaps and, eventually, a forced amputation of society from the majority of scientific achievements, if we choose to keep our societies from tearing themselves apart.

Perhaps the opinions stated before are equally wrong as well as respected. The progress of science is most certainly setting several social problems on the table – many of them never seen before –, but I think the main purpose of human is not a life without problems but a life through solving these problems. As students and future scientists we have learned and are used to solve problems. Can we solve this one, as well?

ΕΚΔΟΤΙΚΟ ΣΗΜΕΙΩΜΑ

Ραγδαίες Εξελίξεις στην Επιστήμη Ποιοι τις ακολουθούν;

Αγαπητοί αναγνώστες,

Ένα ακόμη τεύχος του περιοδικού είναι έτοιμο – μετά από τις συνήθεις πιέσεις από τους πάντες προς τους πάντες, που, φυσικά, είναι μέρος της αγαπημένης καθημερινότητας μιας συντακτικής ομάδας. Κάθε δουλειά περιλαμβάνει, άλλωστε, τις δυσκολίες και τα εμπόδια της. Δίχως όμως αυτά, κανείς εκ των συμμετεχόντων δεν μπορεί να αντιληφθεί τη σημασία και τον αληθινό αντίκτυπο της δουλειάς του.

Αυτή η σκέψη μας φέρνει ίσως στο μυαλό άλλες – σχετικά λυπητερές – σκέψεις: πολλοί άνθρωποι στον κόσμο μοχθούν για να επιτύχουν κάτι χωρίς ποτέ η δουλειά τους να αξιοποιείται και να αναγνωρίζεται όπως θα της ταίριαζε. Η επιστημονική έρευνα, δυστυχώς, ανήκει σε αυτόν τον κλάδο. Οι ραγδαίες συχνά εξελίξεις της μας φέρνουν μπροστά σε τεράστια χάσματα με το παρελθόν, τα οποία είτε δεν μπορούμε να ξεπεράσουμε, μένοντας έτσι πίσω, είτε ξεπερνούμε μεν χωρίς όμως να έχουμε την πλήρη συνείδηση των βημάτων μας…

Σε πρόσφατη συζήτηση με ένα φίλο μου, άκουσα την κάπως ιδιόρρυθμη αλλά σωστά τοποθετημένη άποψη, ότι η προώθηση όλων των σύγχρονων επιτευγμάτων της επιστήμης στην αγορά έχει, από τη μία, δημιουργήσει προβλήματα κοινωνικής συνοχής και, από την άλλη, λειτουργεί ως κατευθυντήρια δύναμη για την ακόλουθη έρευνα. Και, όπως συμβαίνει πάντα, ποιο καλύτερο παράδειγμα από το διαδίκτυο;

Από την εμφάνισή του έως και σήμερα, η ανθρωπότητα έχει κάνει μεγάλα άλματα χάρη σε αυτό. Ωστόσο, ένα μεγάλο κομμάτι του πληθυσμού (στις "αναπτυγμένες" πάντα χώρες) δεν έχει ακόμη την αναμενόμενη επαφή μαζί του. Τα νεότερα άτομα μίας κοινωνίας έχουν την έφεση να ασχολούνται περισσότερο με τον υπολογιστή και όσα μπορεί να τους προσφέρει σε αντίθεση με τα μεγαλύτερα – που, ακόμη κι αν το κάνουν, το αντιμετωπίζουν ως αναγκαίο κακό. Αυτή η κατάσταση από τη φύση της δημιουργεί χάσματα και παίρνοντας υπόψη μας το υπαρκτό χάσμα μεταξύ των γενεών, νομίζω πως μπορούμε άνετα να μιλήσουμε για μία άνευ προηγουμένη πόλωση των διαφορετικών ηλικιών, κάθε μία από τις οποίες προσπαθεί να τραβήξει την

κοινωνία προς διαφορετική κατεύθυνση.

Ταυτόχρονα, όταν ένα τόσο μεγάλο τεχνολογικό επίτευγμα – όπως το διαδίκτυο – είναι μέρος της καθημερινότητας του συνόλου σχεδόν των ανθρώπων (στις "αναπτυγμένες" επαναλαμβάνω χώρες), τότε το κομμάτι της επιστημονικής κοινότητας που ασχολείται με αυτό, καλείται συχνά να επιλύσει θέματα που δεν έχουν άμεση σχέση με τον πραγματικό αγώνα για την αύξηση της γνώσης. Για παράδειγμα, το μεγαλύτερο ποσό υπολογιστικής ισχύος – και άρα ενέργειας – καταναλώνεται στη συντήρηση πληροφοριών όπως φωτογραφίες, βίντεο, μουσικά κομμάτια, διαφόρων ειδών εφφέ και άχρηστες πολυτέλειες που χρησιμοποιούν όλοι σχεδόν οι ιδιώτες χρήστες ιστοσελίδων και blogs ή μέλη των ομάδων κοινωνικής δικτύωσης. Αν η παρέμβαση των απλών πολιτών ήταν περιορισμένη, μέρος αυτής της ισχύος θα μπορούσε να χρησιμοποιηθεί στη μελέτη "σοβαρότερων" προβλημάτων, όπως η χαρτογράφηση των πρωτεϊνών ή η σύνθεση φαρμακευτικών ουσιών.

Θα ήταν αδύνατο να μη σχετίζεται η επιστημονική πρόοδος με την κοινωνική ανάπτυξη. Η εξέλιξη των κοινωνιών μας, είτε σε οικονομικό, είτε σε πολιτισμικό επίπεδο, είναι αλληλένδετη με την ανάπτυξη της επιστήμης. Άλλωστε, η ανάπτυξη ενός λαού μετράται και στο μορφωτικό του επίπεδο.

Επιπρόσθετα, τα νέα τεχνολογικά επιτεύγματα έρχονται συχνά να βελτιώσουν τις συνθήκες ζωής των ανθρώπων. Για παράδειγμα, υπάρχουν ερευνητικά προγράμματα για ανθεκτικότερα αντισεισμικά κτήρια, για ασφαλέστερα μέσα μεταφοράς, για αποτελεσματικότερα φάρμακα ή εμβόλια. Η νανοτεχνολογία υπόσχεται ότι μέσα σε λίγες δεκαετίες πολλά πράγματα που τώρα δυσκολεύουν την καθημερινότητά μας, θα θεωρούνται απλά και αυτονόητα. Η καλύτερη αντίληψη της φύσης της ύλης θα μας επιτρέψει να παράγουμε ευκολότερα ανθεκτικά ή εύπλαστα υλικά με ποικίλες χρήσεις. Τα πρόσφατα παραδείγματα του γραφενίου (Nobel Φυσικής 2010) και των ημικρυστάλλων (Nobel Χημείας 2011) δείχνουν ακριβώς το πνεύμα αυτής της αντίληψης.

Βέβαια, θα μπορούσε κανείς να υποθέσει ότι η μεταβατική περίοδος στην οποία ζούμε δε μας επιτρέπει να αντιληφθούμε ακριβώς το βαθύτερο συσχετισμό της επιστημονικής προόδου και της κοινωνικής εξέλιξης και ότι μετά από κάποια χρόνια – την πάροδο της "απροσάρμοστης" γενιάς, ας πούμε – τα προαναφερθέντα χάσματα θα εκλείψουν. Θα μπορούσε, όμως, να ισχυριστεί και ότι η επιστήμη και η τεχνολογία έκαναν μεγάλα άλματα τον τελευταίο αιώνα και δε φαίνεται να σταματάνε άμεσα αυτή την πορεία, με αποτέλεσμα τη συνεχή διεύρυνση της πολωμένης κατάστασης και την αναγκαστική – εάν θέλουμε να διατηρήσουμε την κοινωνική μας συνοχή – αποκοπή της κοινωνίας από το σύνολο των επιτευγμάτων της επιστήμης.

Ίσως οι παραπάνω απόψεις να είναι εξίσου λανθασμένες όσο και σεβαστές. Η πρόοδος της επιστήμης θέτει αναμφίβολα πολλά κοινωνικά θέματα, αλλά σκοπός των ανθρώπων δεν είναι η ζωή δίχως προβλήματα, αλλά η ζωή μέσω της επίλυσης των προβλημάτων. Ως μαθητές και μέλλοντες επιστήμονες έχουμε μάθει και συνηθίσει να λύνουμε προβλήματα. Μήπως μπορούμε να λύσουμε κι αυτό;

EDITORIALE

Frenetico progresso della Scienza
Chi resta al passo?

Cari lettori,

un altro fascicolo di EP*Magazine* è pronto, dopo le normali pressioni di tutti verso tutti che, ovviamente, fanno parte dell'attività di qualsiasi gruppo editoriale. È naturale che ogni forma di attività comporti il superamento di notevoli problemi e difficoltà; senza di esse nessuno dei componenti il nostro gruppo editoriale capirebbe l'importanza, il significato e l'impatto del lavoro che sviluppa.Questa constatazione porta a un pensiero inquietante: moltissima gente nel mondo si affanna a produrre qualcosa che potrebbe non essere mai vista o utilizzata. Sfortunatamente, anche la ricerca scientifica rientra in questa casistica; l'impressionante velocità della sua evoluzione porta a un evidente scollamento tra passato e futuro, per cui ognuno rischia di rimanere indietro o proiettarsi in avanti senza avere piena coscienza di ciò che succede attorno. In una recente conversazione con un amico, sono arrivato a una conclusione, inusuale ma condivisibile: la spinta dei progressi tecnologici da parte del mercato causa notevoli problemi di coerenza sociale da un lato, e di indirizzamento anomalo delle ricerche dall'altro lato; per non parlare di internet. Dalla sua apparizione a oggi, l'umanità ha compiuto grandi passi evolutivi (sempre riferendosi al mondo occidentale), benché gran parte della popolazione mondiale non abbia ancora familiarità con i prodotti della tecnologia. I giovani tendono a essere più interessati – e quindi a usare intensivamente – il computer, apprezzandone le possibilità che offre. I meno giovani, invece, pur usandolo, lo ritengono un male necessario. Questa situazione, unica di per sé, crea un solco tra differenti età o gruppi sociali; tenendo conto delle preesistenti differenze generazionali (es. tra genitori e figli) credo che in questo caso si possa arrivare a un grado di scontro che non si è mai visto, spingendo parti della società in direzioni totalmente differenti.D'altro canto, quando una così grande risorsa scientifica quale internet, si trova in quasi tutte le abitazioni e ha un ruolo fondamentale nei vari aspetti della vita di tutti i giorni (sempre riferendosi ai Paesi tecnologicamente avanzati), i membri della comunità scientifica che lavorano in questi ambiti, sono normalmente chiamati a risolvere problemi che nulla hanno a che fare con i reali problemi della conoscenza. Per es., la maggior parte delle capacità del computer – di conseguenza di energia – viene male utilizzata per informazioni quali foto, video, musica, effetti speciali e altre inutili e voluttuarie necessità, usate da blogger, navigatori della rete, servizi di scambio sociale. L'intervento dei singoli cittadini è limitato, altrimenti buona parte di questo potere potrebbe essere usato per problemi più seri, come la mappatura proteica, o la composizione chimica dei prodotti naturali d'importanza farmacologica.Ovviamente, oggigiorno è impossibile l'esistenza di uno sviluppo scientifico avulso dall'evoluzione sociale, e ciò sia per gli aspetti economici che culturali del nostro mondo, senza contare che lo sviluppo di una popolazione dipende dal livello culturale dei suoi membri. Le nuove applicazioni tecnologiche influiscono comunque sulle condizioni di vita dell'umanità, come i programmi di ricerca per nuove costruzioni antisismiche, sviluppo di veicoli di trasporto più sicuri, nonché vaccini e medicine più efficaci.Le potenzialità delle nanotecnologie porteranno a semplificare notevolmente ciò che oggi è complicato e difficile, così come la migliore comprensione della natura della materia porterà a produrre e utilizzare con facilità materiali con centinaia di utilizzi diversi. Un esempio recente è costituito da Grafene e quasi-cristalli (Studi premiati con il Nobel per la Fisica nel 2010 e 2011), che mostrano perfettamente il senso di questo punto di vista.

Ovviamente, si potrebbe ritenere che il periodo di trasformazione che stiamo vivendo non dia la possibilità di concretizzare la stretta correlazione tra progresso scientifico ed evoluzione sociale, e che tra qualche anno - quando la generazione non adeguata ai tempi sparirà - le differenze di cui si è parlato svaniranno. Si potrebbe vedere la cosa da un punto di vista diametralmente opposto, cioè che Scienza e Tecnologia hanno fatto grandi passi e che non c'è sentore di una pausa nell'immediato futuro. Il risultato di questo incessante progresso è l'allargamento continuo delle differenze e, probabilmente, un'esclusione forzata della società dalla maggioranza delle scoperte scientifiche se si decidesse di evitare la separazione in due società scollate tra di loro.

Le convinzioni espresse fin'ora potrebbero essere sia sbagliate che giuste, ma il progresso della Scienza quasi certamente evidenzia parecchi contrasti sociali - molti dei quali mai presi in considerazione - ma ritengo che la principale attività umana non debba essere una vita senza problemi, bensì una vita per risolvere i problemi. Come studenti e futuri scienziati, dobbiamo capire che saremo uno strumento per la soluzione di dilemmi. Saremo in grado di affrontare questo, di problema?

РЕДАКЦИОННИ БЕЛЕЖКИ

Драматичен е напредъкът в науката Кой може да го приложи?

Уважаеми читатели,

Друг брой на списанието е готов - след обичайния натиск от всички към всички, които, разбира се, е част от любимия хляб и масло на редакция екип. В крайна сметка, всяка работа се състои от безброй трудности и препятствия. Без тях, обаче участниците не ще почувстват и разберат дълбокото значение и реалното въздействие на своята работа.Тази мисъл може би довежда в ума други - по-скоро тъжни мисли: има много хора в този свят, които се борят да постигнат нещо, което никога не може да се използва или да се признае, както би трябвало.

За съжаление, научните изследвания принадлежат точно към този тип, а обикновено драматични моменти в развитието им са ни изправяли пред огромна пропаст между нашето минало и нашето бъдеще, която или не може да се премине, като по този начин изоставаме, или можем да ги преминем без да имаме пълно съзнание за нашите стъпки ...В един от последните разговори с един мой приятел, се натъкнах на най-необичайното мнение, но добре установено все пак: това задвижване на всички съвременни постижения на науката на пазара е причинило проблеми на социалното сближаване, от една страна, както и насочване на силите за текущите научни изследвания, от друга.

И, както винаги, да дадем за пример интернет:От появата му до днес, човечеството е постигнало големи скокове напред благодарение на него. Въпреки това, голяма част от населението (имаме предвид на "развитите" страни) все още не е на очакваното ниво на запознаване с него. Най-малките членове на обществото са склонни да бъдат по-заинтересовани и, като следствие, използвайте много повече компютрите и се наслаждават на всички ползи от тях, отколкото по-старите членове - които, дори и ако това е така, мислят, че обвързването с компютрите е необходимо зло.

Тази ситуация, по своята същност сама, може да създаде разногласия между различните възрастови и социални групи; като се вземат предвид съществуващите вече възрастови различия (между родители и деца), аз вярвам, че може лесно да се говори за поляризация, каквато никога не сме виждали преди, между различните възрастови групи, всички се опитват да водят общество в различна посока.

От друга страна, когато такова голямо научно постижение като интернет намира своя път в почти всяка къща и участва в нашето ежедневие (винаги се позовавам на "развитите" страни), членовете на научната общност, които работят по него обикновено са призвани да решават проблеми, които

нямат нищо общо с реалната борба за създаването на знания. Например, най-голямо количество компютърна мощност и следователно на енергия, се губи за запазване на информация, като снимки, видео, музика, някои видове специални ефекти и други безполезни луксозни стоки, използвани от частни уеб страници, блогове или членове на социални мрежи и услуги. Ако намесата на обикновените граждани бъде ограничена, част от тази енергия може да се използва за изследване на по-"сериозни" проблеми, като например протеини, картография или състав на медицински продукти.

Разбира се, би било невъзможно да не се свързва социалното развитие с напредъка на науката в днешно време; развитието на нашето общество, било във финансов или културен аспект, е свързано с развитието на науката. Излишно е да споменавам, че развитието на населението се отчита от културното ниво на членовете му.

Освен това, новите технологични постижения обикновено се правят за да се подобрят условията на живот на човечеството. Например, има научноизследователски програми за по-устойчиви противоземетръсни сгради, за по-безопасни транспортни средства, по-ефективни лекарства или ваксини. Нанотехнологията обещава, че в рамките на няколко десетилетия няколко неща, които сега правят живота ни труден ще се считат за лесни и достъпни. По-добро разбиране на същността на въпроса ще ни позволи да произвеждаме по-здрави или красиви материали със стотици приложения по-лесно. Последните примери за графен (Нобелова награда по физика за 2010) и квазикристали (Нобелова награда по химия да 2011) показват точно смисъла на тази гледна точка.

Разбира се, може да се приеме, че преходният период в който живеем не ни дава възможност да разберем по-дълбоката връзка на научния прогрес и социална еволюция и че след няколко години - когато "неподходящото" поколение ще ни остави, пропастта, за която споменах ще изчезне. В същото време, може да се приеме обратното: че науката и технологиите са направили огромни скокове до момента и няма признаци на паузи развитието им в не толкова далечното бъдеще. Резултатът от този непрекъснат напредък ще бъде непрекъснато разширяване на празноти и, в крайна сметка, принудителна ампутация на обществото от по-голямата част от научните постижения, ако изберетм да запазим нашите общества от разкъсване.

Може би становищата, посочени преди са еднакво погрешни, както и уважавани. Напредъкът на науката е най-вероятно да създаде някои социални проблеми - много от тях никога не сме е виждали преди, но мисля, че основната цел на човека не е живот без проблеми, а живот чрез решаване на тези проблеми. Като ученици и бъдещи учени сме се научили да решаваме проблеми. Можем да решим този, нали?

EDITORIAL

Progres dramatic în ştiinţă
Cine poate ţine pasul?

Dragi cititori,

Este finalizat un alt număr al revistei – finalizat, după presiunea exercitată de fiecare asupra celuilalt, mă refer la cei care, desigur, fac parte din nucleul echipei de editare. În definitiv, orice realizare implică nenumărate dificultăți și obstacole. Însă, fără ele, nici unul dintre participanți nu ar simți și înțelege importanța mai profundă și impactul real al implicării sale.

Acest gând, probabil, declanșează alte gânduri, cam triste: există mulți oameni în această lume care luptă pentru a realiza un lucru iar acesta s-ar putea să nu fie niciodată utilizat sau apreciat la justa sa valoare. Din păcate, cercetarea științifică aparține exact acestei categorii; evoluțiile de obicei dramatice din domeniile ei prezintă breşe între trecutul și viitorul nostru, breşe pe care fie nu le putem acoperi, fie nu le putem depăşi şi rămânem astfel în urmă, sau le depăşim fără a fi pe deplin conştienţi de paşii făcuţi ...

Într-o conversație recentă avută cu unul din prietenii mei, am avut o opinie chiar neobișnuită, dar totuși consacrată: aceea că propulsia tuturor realizărilor moderne ale științei aflate pe piață a produs probleme de coerență socială, în aceeaşi măsură în care, pe de altă parte, ea reprezintă o forță directoare pentru cercetarea aflată în desfăşurare. Și, ca întotdeauna, să luăm exemplul clar al internetului.

De la apariție până în prezent, omenirea a realizat salturi foarte mari datorită lui. Cu toate acestea, o mare parte a populației (ne referim la ţările «dezvoltate») încă nu este familiarizată cu acesta la nivelul aşteptat. Cei mai tineri membri ai societății tind să fie mai interesați și, ca o consecință, utilizează mai mult calculatoarele și se bucură de toate beneficiile lor, decât membrii mai în vârstă - care, chiar dacă o fac, consideră utilizarea acestora un rău necesar. Această situație, prin natura sa, poate crea decalaje între diferite grupuri de vârste sau grupuri sociale; ținând cont de prăpastia dintre generaţii care oricum există (cea dintre părinți și copii), cred că putem vorbi cu ușurință de o polarizare, neobișnuită, între grupe de vârstă diferite, toate încercând să împingă societatea într-o altă direcție.

În plus, atunci când o astfel de mare realizare ştiintifică – cum este internetul – îşi croieşte drum în aproape fiecare casă și ia parte la viața noastră de zi cu zi (ne referim ca de obicei la țările «dezvoltate»), membrii comunității științifice care lucrează la ea sunt, de obicei, chemaţi să rezolve probleme care nu au nici o legătură cu efortul depus pentru evoluţia cunoaşterii. De exemplu, o mare parte din capacitatea, şi prin urmare din energia calculatoarelor este irosită pentru a stoca informații cum ar fi fotografii, clipuri video, muzică, diverse tipuri de efecte speciale sau alte lucruri inutile, de lux, folosite de pagini web private, blog-uri sau membri ai serviciilor de rețele sociale. Dacă intervenția cetățenilor obişnuiţi ar fi limitată, o parte din această energie ar putea fi utilizată pentru cercetarea unor probleme mult mai «serioase», cum ar fi cartografierea proteinelor sau compoziția medicamentelor.

Desigur, ar fi imposibil să nu se facă nici o legătură între dezvoltarea socială şi progresul științific din zilele noastre; evoluția societății noastre, atât pe plan financiar cât şi pe plan cultural, este legată de evoluția științei. Este inutil să menționăm că dezvoltarea societăţii este măsurată după nivelul cultural al membrilor săi.

În plus, noile realizări tehnologice vin, de obicei, să îmbunătățească condițiile de viață ale omenirii. De exemplu, există programe de cercetare științifică pentru realizarea de clădiri mult mai rezistente seismic, pentru vehicule de transport mai sigure, pentru medicamente sau vaccinuri mai eficiente. Nanotehnologia promite că în câteva decenii multe lucruri care îngreunează acum viața vor fi considerate simple și de la sine înţelese. O mai bună înţelegere a naturii materiei ne va permite să producem materiale mai dure sau mai bine configurate, cu sute de scopuri. Recentele exemple cu privire la grafen (Premiul Nobel pentru Fizica 2010) și quasicristalele (Premiul Nobel pentru Chimie 2011) arată exact sensul acestui punct de vedere.

Desigur, se poate presupune că perioada de tranziție în care trăim nu ne dă posibilitatea de a realiza o legătură mai strânsă dintre progresul științific și evoluția socială și că, după o perioadă de timp, atunci când generația «slabă» nu va mai fi, lacunele menționate anterior vor dispărea. În același timp, s-ar putea presupune şi contrariul: că știința și tehnologia au făcut salturi uriașe până în prezent și nu există nici un indiciu cu privire la încetinirea acestui proces în viitorul nu prea îndepărtat. Rezultatele acestui progres continuu ar fi o extindere continuă a breşelor și, în cele din urmă, o amputare forțată a societății de majoritatea realizărilor științifice, dacă vom alege să împiedicăm societatea de la scindare. Poate că opiniile exprimate mai sus pot fi considerate eronate sau din contră apreciate. Progresul științei scoate la iveală în mod clar o serie de probleme sociale - multe dintre ele nemaivăzute înainte, dar cred că scopul principal al omului nu este o viață fără probleme, ci o viață trăită prin rezolvarea problemelor. Ca studenți și viitori oameni de știință am învățat să rezolvăm probleme, suntem obişnuiţi cu acest lucru. O putem rezolva şi pe aceasta?

BAŞYAZI

Bilimdeki etkili değişimi kim takip edebilir ki?

Değerli Okuyucular,

Dergi yazı işlerinin bir gereği olarak derginin bir diğer sayısı da hazır.Herşey bir yana her iş sayısız zorluk ve engel teşkil etmektedir. Onlarsız katılımcıların hiçbiri yaptığı işin değerini ve gerçek etkisini ne hissedebilir ne de anlayabilir.

Bu düşünce elbette üzücü olsada diğer düşünceleri de zihinde beraberin de getirmekte.Bu dünyada gerçekleşmesine imkan tanımadığı için bir işle uğraşmak istemeyen bir sürü insane mevcut.Ne yazı ki bilimsel araştırma gerçekten bu yere aittir.Bilimin dallarının etkili değişimleri bizleri asla geçemeyeceğimiz geçmişimiz ve geleceğimiz arasındaki büyük boşluktan önce bizleri bir araya getirmektedir.

Arkadaşlarımdan bir tanesiyle yaptığım son konuşmada,çok değişik fakat çok sağlam bir fikirle karşılaştım. Bilim dünyasında gerçekleşen tüm başarılar devam eden araştırmalara yeni soluklar getirdiği gibi toplumsal ahenkte de bir takım problemleri beraberinde getirdi. Ve her zaman olduğu gibi internet örneğini verecek olursak:

Var oluşundan bugüne kadar insanoğlu bir sürü büyük başarılar elde etti.Ama nüfusun büyük bir kısmı (gelişmiş ülkeleri kastedersek) hala bunun farkında değil.Toplumun en genç fertleri bilgisayarlarla çok ilgili olma eğiliminde ve sonuç olarak bilgisayarı çok karışık bulan ve düşünen yaşlı nüfusa nazaran çok fazla bilgisayar kullanmakta ve bir takım faydalar elde etme eğilimindeler.Bu durum doğal olarak nesiller arasında ve sosyal gruplar arasında uçurumlar yaratmakta ve ben farklı yaş grupları arasında daha önceden hiç olmamış gibi kutuplaşmanın olduğunu da rahatlıkla söyleyebilmekteyim.

Aynı zamanda internet gibi bilimsel bir başarı her eve ve yaşamımıza girdiğinde (gelişmiş ülkeleri yine kastedersek),bilim üzerinde çalışan toplumların üyeleri genellikle problemleri çözme üzerine çalışırlar.Mesela bilgisayarın en büyük gücü,enerjisi,fotoğraf,video,müzik,blog,web sayfaları bir sürü gereksiz lüks bilgileri muhafaza etmek için kullanılmakta.Sıradan vatandaşların böylesi dahil oluşu biraz sınırlansa,bu gücün bir bölümü proteinler,haritacılık yada tıbbi ürünlerin kompozisyonu için de kullanılabilir.

Elbette günümüzde bilimsel gelişme ile sosyal gelişmeyi parallel tutmak imkanzıdır, gerek ekonomikl gerek se kültürel açıdan toplumumuzun evrimi, bilimin evrimi ile beraberdir.Toplumun gelişiminin üyelerinin kültürel seviyesine bağlı olduğunu söylemekten bahsetmek de gereksizdir.

Dahası yeni teknolojik başarılar, genellikle insanlığın hayat şartlarını geliştirmeye dönük olmaktadır. Mesela, daha etkili tıp, ilaçlar, daha güvenli taşıma ve binalar için bir takım bilimsel araştırma programları mevcuttur. Nanoteknoloji bir kaç yıl içinde hayatımız da zor olan ve gözüken şeylerin kolay ve basit olacağını göstermekte. Doğayı daha iyi anlama bizlere yüzlerce cismin kolay kullanımını sağlayacak. Son grafen (2010 Fizik Nobel Ödülü) ve yarı Kristal (2011 Kimya Nobel Ödülü) örnekler bu görüşün anlamını işaret etmektedir.

Elbette, yaşadığımız geçiş dönemi bilimsel gelişme ile sosyal evrim arasındaki derin bağlantıyı anlamamıza fırsat vermemektedir. Bir kaç yıl sonra, uyumsuz nesil gittiğinde,önceden bahsedilen nesil farkının kaybolduğunu farzedelim. Aynı zamanda, birisi tersini de düşünebilir. Bilim ve teknoloji bu zamana kadar b birisi tersini de düşünebilir. Bilim ve teknoloji bu zamana kadar bir çok sıçramalar yaptı. Şimdi ve gelecekte dahi gittikleri yolda bir duraksama dahi olmayacak.Bu süregelen ilerlemenin sonucu nesiller arasında uzaklaşma ve sonunda bilimsel araştırma ve gelişmelerden uzak engelli bir toplum meydana gelecek.

Belkide önceden bahsedilen fikirlerin hepside yanılgı olabilir.Bilimin ilerleyişi Masaya bir takım sorunlar getirecektir.Ama bence insanın temel amacı sorunsuz bir hayat değil,sorunları cozen bir hayat.Öğrenciler ve geleceğin bilim adamları olarak öğrendiğimiz sorunları çözmek.Bunu da çözebilir miyiz acaba?

Iconography

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Abacus
History, Evolution and Actuality

Abacul: Istorie, Evoluție și Actualitate

by Roșca Mioara Eugenia

Abacus – the first calculation tool, represents the first link in the development of computing tools and, paradoxically, it is still used nowadays from the the earliest age (for understanding mathematical operations) to the most advanced (in accounting, in Asian countries).

The chronology of the development of the calculation resources is divided into five sections:

1. The stage of the computational tools
2. The stage of the mechanical computing machines
3. The stage of the electronic computing machines with stored programs
4. The stage of the invention and development of the microprocessor
5. The stage of the improvement and globalisation of personal computers

Abacus has been used since the dawn of human civilization, by people that are far away from each other, which leads to the conclusion that it was invented independently and almost simultaneously, out of a need imposed by the every day life to keep track of things, goods and crops when it came to large quantities:

1. The history of the computer begins 2400 years BC in Mesopotamia, with the invention pf the precursor of the abacus: a tablet of clay, with notches dug

Abacul – primul instrument de calcul, reprezintă veriga de început în dezvoltarea instrumentelor de calcul și, în mod paradoxal, este încă utilizat în zilele noastre de la cele mai fragede vârste (pentru înțelegerea operațiilor matematice) până la cele mai înaintate (în contabilitate, în țările asiatice).

Cronologia evoluției posibilităților de calcul este împarțită în cinci mari secțiuni:

1. Etapa instrumentelor de calcul
2. Etapa maşinilor mecanice de calcul
3. Etapa maşinilor electronice de calcul cu program memorat
4. Etapa apariției si dezvoltării microprocesorului
5. Etapa perfecționării și universalizării calculatoarelor personale

Abacul a fost utilizat încă de la începuturile civilizației umane, de popoare aflate la mare distanță unele de altele, ceea ce conduce la ideea că a fost inventat independent și aproape simultan, din nevoia impusă de viața cotidiană de a ține socoteala lucrurilor, marfurilor și recoltelor, atunci când era vorba de cantități mari:

1. Istoria calculatorului incepe cu 2400 ani î.e.n., în Mesopotamia, prin apariția precursorului abacului: o tăbliță din argilă, pe care erau săpate şanţuri, în şanţuri fiind plasate pietricele care se deplasau de-a lungul acestora. Mai tarziu, prin găurirea bilelor și înșirarea acestora, „calculatorul cu pietricele" s-a transformat în binecunoscutul abac.

2. Abacul, născut în China cu 1500 ani î.e.n., avea inițial 131 coloane, două mărgele la vârf reprezentând cerul, alte 5 la bază, reprezentând pământul. Intrat în uzul comun în secolul XIV sub numele de „suan-pan", modelul evoluează, fiind format din două serii a câte 13 baghete pe care culisau biluțe găurite.

3. Japonezii au importat abacul din China, prin Coreea, in sec XV şi l-au adoptat propriului lor mod de gândire. Abacul japonez ("soroban") este compus din 25, 21,15 sau 10 fire verticale (in functie de versiune) a câte 5 bobițe împărțite în patru grupe; în plus mai are o tijă orizontală.

Bobițele de sub tijă au valoare de 1, cele de deasupra au valoare de 5. Pot fi efectuate toate operațiunile aritmetice și multe din operațiunile algebrice.

on it; stones were placed in the notches that could move along them. Later, by perforating the balls and stringing them, the “pebbles computer” turned into the well known abacus.

2. The abacus, born in China in about 1500 BC, originally had 131 columns, the two beads at the top represented the sky, the other 5 at the bottom represented the earth. Becoming largely used in the fourteenth century under the neme of “suan-pan”, the model evolved into one consisting of two series of 13 rods on which slided perforated balls.

3. The Japanese imported the abacus from China, through Korea, in the 15th century and adjusted it to fit their own way of thinking. The Japanese abacus (“soroban”) is composed of 25, 21.15 or 10 vertical wires (depending on version) of 5 beads divided into four groups; in addition, it also has a horizontal rod.

The beads under the rod have the value 1, those above it have the value 5. All arithmetic operations can be performed on it and also many algebraic operations. The Japanese abacus is the fastest of all abacuses. Japanese people train their intelligence by using the abacus, aiming to do mental calculation without using a soroban - which is called anza by the Japanese. A trained user does complex operations in mind very quickly. For example, adding mentally 10 numbers of 5 digits each in just 3 seconds, calculation made by a Japanese champion.

4. The Roman abacus had two sets of eight rods on which would slide perfored beads (abaculi), showing progressively, from right to left, ounces (sub) units, tens, hundreds to millions. The Romans expanded the use of abacus in schools and state institutions.

5. The Incas used the abacus called “yupana”: it was composed of several containers placed in rows, in these bowls there were beans or pebbles. On the lower range the container had the value 1 and contained a little ball (bean or pebble), the container on the next line contained two balls with the value of 2, the third with the value 3, the fourth with the value of 5 had five. So in total there were: 1 + 4 + 9 + 25 = 39. On the upper range, the value of the balls in the containers was multiplied by 40, so there were: 40, then 80, 120 and 200 and so on on the higher ranges.

6. Around 1000 A.D., the Aztecs used an abacus called “nepohualtzitzin” consisting of threads

Abacul japonez este cel mai rapid dintre toate abacele. Japonezii isi antrenează inteligența cu ajutorul abacului, unul dintre scopuri fiind calculul mintal (fără un soroban in față) - ceea ce japonezii denumesc anza. Un utilizator antrenat face operațiuni complexe în minte extrem de rapid. Ca exemplu, adunarea in minte a 10 numere de câte 5 cifre fiecare în numai 3 secunde, calcul efectuat de un campion japonez.

4. Abacul roman avea două serii de opt baghete pe care culisau bile găurite (abaculi), care arătau progresiv, de la dreapta la stânga, unciile (subunitățile), unitățile, zecile, sutele până la milioane. Romanii au extins folosirea abacului in scoli si in instituțiile statului.

5. Incașii foloseau abacul numit “yupana”: acesta era compus din mai multe recipiente așezate pe șiruri; în aceste vase erau puse fasole sau pietricele. Pe șirul inferior, recipientul avea valoarea de 1 și conținea maxim o biluță (fasole sau pietricică); recipientul de pe firul următor conținea două cu valoarea 2; a treia cu valoarea 3 a patra avea cinci cu valoarea de 5. Așadar, în total erau: 1 + 4 + 9 + 25 = 39. În șirul superior, valoarea biluțelor din recipiente era multiplicată cu 40; prin urmare erau: 40, apoi 80, 120 și 200 și tot așa pe șirurile superioare.

6. In jurul anului 1000, aztecii foloseau un abac numit “nepohualtzitzin”, format din ațe fixate pe o rama de lemn, pe care erau înșirate mărgele.

7. In Rusia abacul este inventat la începutul secolului XVII şi este format din 10 rânduri, fiecare cu câte 10 mărgele. Cand nu se socotește, margelele

attached to a wooden frame on which there were strung beads.

7. The Russian abacus was invented in the early seventeenth century and consisted of 10 rows, each with 10 beads. When not used for counting the beads were moved to the right. When used, the beads were moved to the left. To make it more visible, the middle 2 beads on each string had a different color than the other eight beads.

8. Today abacus is used as a teaching tool for children in the early years of primary school. Using the abacus in school is both pedagogically recommended and very suitable as it helps children understand the abstract concept of numbers, having as a starting point real objects. For example, hereunder could be seen an abascus used at "Ovid Densusianu" School in Fagaras, Romania:

In the era of electronic computers it is surprising importance the abacus still has as a computing tool in the Asian countries. Those traveling in these areas are often surprised that traders do calculations with an electronic computer which are after that checked on an abacus!

The fact that the abacus, in its various forms, has lasted for more than 4000 years shows that at the foundation of major achievements there are basic things – principles, laws, rules. They remain milestones in the evolution of both technology and the human progress.

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sunt deplasate la dreapta. In timpul manipularii, margelele sunt mutate la stanga. Pentru o vizualizare mai usoara, 2 margele din mijlocul fiecarui sir au o culoare diferită față de celelalte opt mărgele.

8. Astazi abacul este folost ca instrument didactic pentru copiii din primii ani de școală primară. Folosirea abacului în școală este, din punct de vedere pedagogic, recomandat și foarte potrivit întrucât îi ajută pe copii să inteleaga conceptul abstract al numerelor, plecând de la obiecte concrete. Spre exemplu, la Scoala Generala „Ovid Densusianu" din orasul Făgăraș, România, se folosesc astfel de numărători:

In era calculatoarelor electronice este surprinzătoare importanța pe care abacul, ca instrument de calcul, încă o mai are în țările asiatice. Cei care călătoresc în zonele respective sunt surprinsi de faptul ca adesea comerciantii fac socoteli cu un calculator electronic, dupa care le verifica cu un abac!

Faptul că abacul, sub diferitele sale forme, dăinuiește de peste 4000 ani, ne arată că la baza marilor realizări stau lucrurile elementare – principii, legi, reguli. Acestea rămân puncte de referință atât în evoluția tehnologiei cât și în devenirea umană.

3. http://www.hiwtc.com/photo/products/38/00/41/4140.jpg
4. http://sliderulemuseum.com/AbaciEphemera/RomanHandAbacusReplica_Phot o FromJoernLuetjens OnLineMuseum.jpg
5. http://sliderulemuseum.com/Abaci/Abacus_Russian.jpg
6. Children from "Ovid Densusianu" Secondary School, Făgăraș, județul Brașov, România. (autor: profesor Roșca Mioara Eugenia)
7. Children from "Ovid Densusianu" Secondary School, Făgăraș, județul Brașov, România (autor: teacher Roșca Mioara Eugenia)
8. http://www.shutterstock.com/pic-100734262/stock-photo-old-abacus-with-calculator-and-hands.html

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Nanopoulos Dimitrios and his ten dimensions

Νανόπουλος Δημήτριος και οι δέκα διαστάσεις του...

by Olga-Rafaella Apostolouda

From ancient times until the present many Greeks dealt successfully with sciences. One of them is Dimitrios Nanopoulos who work in an American university. He was born in Athens on 13 September 1948, and he is a well-known scientist and academic.

He studied in Athens University and continued his research studies in the University of Sussex in UK, where he received his doctorate in theoretical physics.

His research work

He has been a researcher to the CERN programme in Switzerland for many years. He participates in research teams with many universities, which are located abroad. Nowadays, he is a director in HARC in Houston, where he supervises the research team of the World Laboratory, which is based in Lausanne.

He has written more than 520 academic essays in international journals.

His main work has to do with practilal physics and cosmology.

He is also interested in biophysics and the theories of superstrings, the theory of everything and the theories of supersymmetry, supergravity, and multiverse.

Από την αρχαιότητα μέχρι σήμερα πολλοί Έλληνες ασχολήθηκαν και διέπρεψαν στις θετικές επιστήμες.

Ένας επιστήμονας που έχει διακριθεί και διαπρέπει σε πανεπιστήμιο της Αμερικής είναι ο Δημήτριος Νανόπουλος. Γεννήθηκε στην Αθήνα στις 13 Σεπτεμβρίου 1948. Φυσικός, πανεπιστημιακός και ακαδημαϊκός.

Σπούδασε Φυσική στο Πανεπιστήμιο Αθηνών και συνέχισε τις σπουδές του στο Πανεπιστήμιο Σάσεξ (Sussex) της Αγγλίας, όπου απέκτησε το διδακτορικό του, το 1973, στη Θεωρητική Φυσική των Υψηλών Ενεργειών.

Ερευνητικό Έργο

Έγινε ερευνητής στο Κέντρο Πυρηνικών Ερευνών Ευρώπης (CERN) στη Γενεύη της Ελβετίας και για πολλά έτη ανήκε στο ανώτερο ερευνητικό προσωπικό του Κέντρου. Έχει συνεργαστεί με πολλά πανεπιστήμια του Εξωτερικού. Σήμερα είναι διευθυντής του Κέντρου Αστροσωματιδιακής Φυσικής του Κέντρου Προχωρημένων Ερευνών (HARC), στο Χιούστον, Τέξας, όπου διευθύνει ερευνητικό τμήμα του World Laboratory, που εδρεύει στη Λωζάνη.

Έχει συγγράψει τουλάχιστον 520 πρωτότυπες εργασίες.

Το κύριο ερευνητικό του έργο ανήκει στο πεδίο της σωματιδιακής φυσικής και της κοσμολογίας

Στα ερευνητικά του ενδιαφέροντα ανήκουν και η δημιουργία μιας ενοποιημένης θεωρίας όλων των δυνάμεων της φύσης, η θεωρία του Παντός, η υπερσυμμετρία, η υπερβαρύτητα, οι θεωρίες υπερχορδών και η βιοφυσική.

Cern

Συμμετείχε σε διάφορα πειράματα και συμμετείχε σε ένα πείραμα για την επιβεβαίωση της θεωρείας των υπερχόρδων, όπου με μαθηματικές εξισώσεις αποδείχθηκε ότι δεν υπάρχει μόνο ένα, αλλά πάρα πολλά σύμπαντα δεν αντιλαμβανόμαστε ότι πιθανότατα ζούμε σε δέκα διαστάσεις δηλαδή εκτός από τις γνωστές τέσσερις διαστάσεις, (μήκος, πλάτος, ύψος) και ο χρόνος υπάρχουν ακόμα έξι ή επτά διαστάσεις.

Το σωματίδιο του Χιγκς

Επίσης είναι ένας από τους πρωτεργάτες της πρόσφατης ανακάλυψης του σωματιδίου Χιγκς. Σύμφωνα με αυτόν «αυτό το σωματίδιο έχει μία ιδιαιτερότητα και το ψάχναμε πενήντα χρόνια τώρα γιατί είναι ένας βασικός λίθος σε όλο αυτό το κατασκεύασμα που ονομάζομε standard model και είναι απόρροια ενός μηχανισμού Χιγκς, ο οποίος μας δείχνει πώς η ύλη αποκτά τη μάζα».

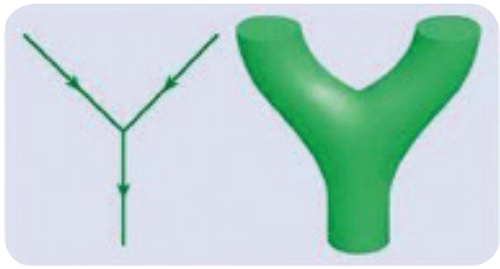
Cern

There are many spaces and it is difficult, for ordinary people, to understand that…

1. the world where we live has ten dimensions,
2. apart from the familiar four dimensions (height, width, length, time) there are another six or seven dimensions into space.

Higgs mechanism

Dimitrios Nanopoulos was part of a team who discovered and researched "Higgs mechanism". In particle physics, Higgs mechanism is a kind of mass generation mechanism, a process that gives mass to elementary particles. According to this theory, particles gain mass by interacting with Higgs-field that permeates all space.



More precisely, "Higgs mechanism" endows gauge bosons in a gauge theory with mass through absorption of Nambu-Goldstone bosons arising in spontaneous symmetry breaking.

Basic Awards:

- 1997, Member of the Academy of Athens
- 1999 and 2005, Awards from the Institute of Gravity, USA
- 2006,Internation award from The Onassis Foundation
- 2009, Enrico Fermi Award the Italian Society for Physics

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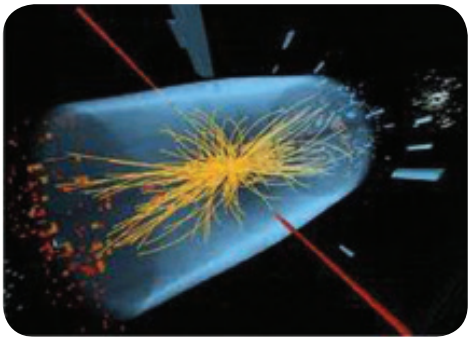
2. Encyclopedia Domi (25 st volume, page 480-481) DOMI EDITIONS 2009
3. http://tvxs.gr/news/sci-tech/%CE%B4-%CE%BD%CE%B1%CE%BD%CF%8C%CF%80%CE%BF%CF%85%CE%BB%CE%BF%CF%82-%C2%AB%CE%B6%CE%BF%CF%8D%CE%BC%CE%B5-%CF%83%CE%B5-%CE%B4%CE%AD%CE%BA-%CE%B1-%CE%B4%CE%B9%CE%B1%CF%83%CF%84%CE%AC%CF%83%CE%B5%CE%B9%CF%82-%CE%B1%CE%BB%CE%BB%CE%AC-%CE%B4%CE%B5%CE%BD-%CF%84%CE%BF-%CE%B1%CE%BD%CF%84%CE%B9%CE%BB%CE%B1%CE%BC%CE%B2%CE%B1%CE%BD%CF%8C%CE%BC%CE%B1%CF%83%CF%84%CE%B5%C2%BB



Τιμητικές διακρίσεις:

- 1997 εξελέγη τακτικό μέλος της Ακαδημίας Αθηνών.
- 1999 και το 2005 απέσπασε το βραβείο του Ιδρύματος Ερευνών της Βαρύτητας, στη Μασαχουσέτη των Η.Π.Α.
- 2006 το διεθνές βραβείο του Κοινωφελούς Ιδρύματος Αλέξανδρος Σ. Ωνάσης.
- 2009 τιμήθηκε με το βραβείο Enrico Fermi της Ιταλικής Εταιρείας Φυσικής.

Iconography

http://tvxs.gr/news/sci-tech/%CE%B4-%C%BD%CE%B1%CE%BD%CF%8C%CF%80%CE%BF%CF%85%CE%BB%CE%BF%CF%82-%C2%AB%CE%B6%CE%BF%CF%8D%CE%BC%CE%B5-%CF%83%CE%B5-%CE%B4%CE%AD%CE%BA%CE%B1-%CE%B4%CE%B9%CE%B1%CF%83%CF%84%CE%AC%CF%83%CE%B5%CE%B9%CF%82-%CE%B1%CE%BB%CE%BB%CE%AC-%CE%B4%CE%B5%CE%BD-%CF%84%CE%BF-%CE%B1%CE%BD%CF%84%CE%B9%CE%BB%CE%B1%CE%BC%CE%B2%CE%B1%CE%BD%CF%8C%CE%BC%CE%B1%CF%83%CF%84%CE%B5%C2%BB

http://www.google.gr/url?sa=i&source=images&cd=&cad=rja&docid=BedR9QoP2kCFXM&tbnid=l_GvCYPVN8aN6M:&ved=0CAcQjB0wAA&url=http%3A%2F%2F

www.science.tamu.edu%2Farticles%2F856&ei=smtLUcv0C4iLtAb7pIDwAg&psig=AFQjCNHKHTrK_hoYs3lL7ila1ehcrFbH6A&ust=1363983666268548

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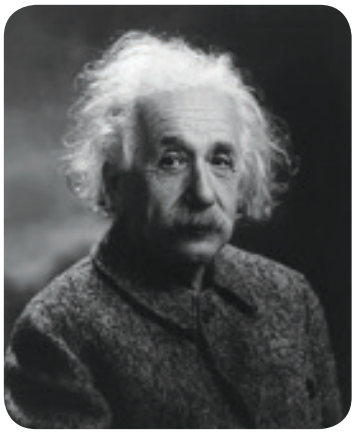
Strange things about scientists

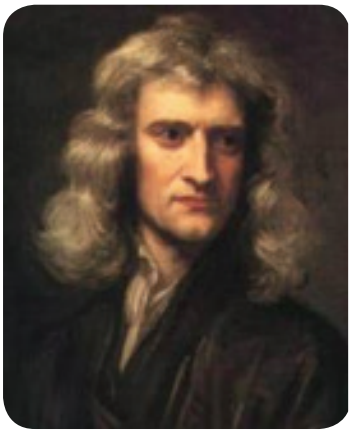
by Athanasios Papias



Albert Einstein

After getting a divorce with his first wife, Albert married his cousin Elsa. Moreover, Albert gave the money from the Nobel Prize which earned to his ex-wife to raise their children.

Einstein, the war pacifist, urged England to build the Atom Bomb. A physicist Leó Szilárd convinced Einstein to write a letter to the president Franklin Delano Roosevelt to send a letter to United States. In this letter it was written that America must make an atom bomb before Nazi on its own.



Issac Newton

Baby Newton wasn't expected to live. Isaac was a very small baby not expected to survive. His mother even said that Isaac was so small that he could have fit inside a bowl of 1lt.

Isaac was one of the worst students in his class until a bully at school kicked him. Isaac wanted to fight with him even though he was smaller. He won. Then he decided to be better than the bully at school.

Benjamin Franklin

Benjamin Franklin was at the age of seventy when he signed the Declaration of Independence. He introduced tofu, a soft, bland, white cheeselike food, high in protein content, made from curdled soybean milk, to the colonies. He had a pet lizard named Mozart. He established the first fire department ever. Last but not least, when he was 16, he became a vegetarian because he wanted to spend his money on books instead of meat.

He was a civil worker, a founding father, scientist, publisher and author, all at the same time.

Marie Curie

British Prime Minister Margaret Thatcher used to be one of her students.

Pierre Currie, her husband and collegue was killed in a traffic accident.

She had a scandalous love affair with a married man, after the death of her husband... he was a famous mathematician.

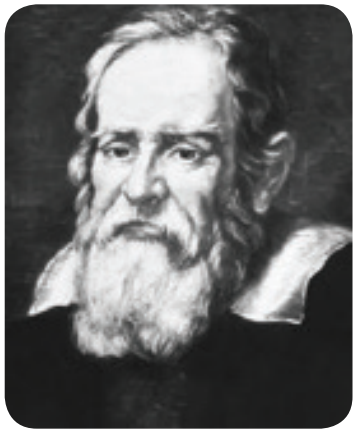
One of her daughters became a pianist and the other one, Irene, won a nobel prize in physics just like her mother.

Galileo Galilei

Galileo enrolled to do a medical degree at the University of Pisa but never finished, instead choosing to study mathematics.

Later in his life, Galileo became blind. There have been theories that his blindness came from his telescopic research, but most likely he lost his sight from cataracts or glaucoma.

A spacecraft mission of discovering the space took his name.



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The camera

Η φωτογραφική μηχανή

by Aimilia Ioakeimidou

From the beginning of human life people had need to copy what they saw. For this reason they painted on the walls of caves and on clay pots. With the passing of time, however, they weren't satisfied with this. This is why they created the camera with which they could copy pictures with more detail and with less time and effort. This invention caused a lot of changes in people's everyday life and was a great step for civilization.

The parts of the first camera

The first camera which was made was called pinhole. This camera was comprised of four basic parts. The main part was the dark room, which was a box. The interior of the box was painted black. The film was on one side of the box and on the other side was the lens. There was also a shutter, which controlled the exposure time of light on the surface of the film. There was also the diaphragm, a mechanism with metal plates which controlled the amount of light which passed onto the lens. Finally, there was a glass lens, which concentrated the light into a particular spot on the interior of the camera.

The simplest way to take a picture: At first the light which is reflected from the object enters the camera and passes first to the lens and then to the diaphragm and finally it ends up in the dark room where the film is.

In this way the object is reflected onto the film but inverted.

Historical evolution

The camera's history began from the middle of the 19o century but some people believe that it has its roots in the ancient Greek culture. We know from

a lot of sources that Aristotelis had de-

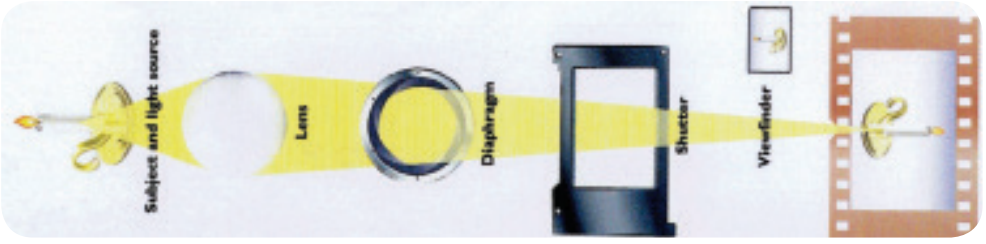
Ο άνθρωπος από την αρχή της ζωής του είχε την ανάγκη να αποτυπώνει αυτά που έβλεπε. Έτσι ζωγράφιζε τοιχογραφίες σε σπήλαια και σε πήλινα σκεύη. Με το πέρασμα των αιώνων όμως δεν αρκέστηκε μόνο σ' αυτά. Έτσι κατασκεύασε τη φωτογραφική μηχανή με την οποία μπορούσε να αποτυπώνει με μεγαλύτερη λεπτομέρεια και λιγότερο κόπο και χρόνο τις εικόνες που ήθελε. Η εφεύρεση αυτή προκάλεσε πολλές αλλαγές στην καθημερινή ζωή των ανθρώπων, κάνοντας ένα μεγάλο βήμα στον πολιτισμό.

Τα μέρη της πρώτης φωτογραφικής μηχανής

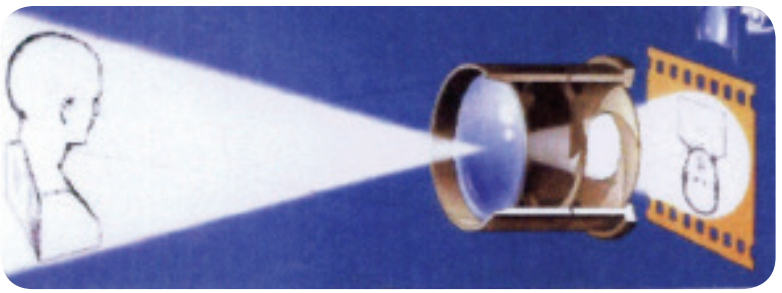
Η πρώτη μηχανή που κατασκευάστηκε ονομάστηκε pinhole. Η μηχανή αυτή αποτελούνταν από τέσσερα βασικά μέρη. Το κυριότερο τμήμα της ήταν ο σκοτεινός θάλαμος. Δηλαδή, ένα κουτί βαμμένο μαύρο στο εσωτερικό του, όπου στη μία πλευρά υπήρχε το φιλμ και στην άλλη ο φακός. Επίσης υπήρχε ο φωτοφράχτης ο οποίος όριζε το χρόνο έκθεσης των φωτεινών ακτινών πάνω στην επιφάνεια του φιλμ και το διάφραγμα –μηχανισμός με μεταλλικά ελάσματα που έλεγχε την ποσότητα των ακτίνων που θα περνούσαν από το φακό. Τέλος, υπήρχε ένας γυάλινος φακός που ανάγκαζε τις ακτίνες να συγκεντρώνονται σ' ένα σημείο στο εσωτερικό της μηχανής.

Η πιο απλή διαδικασία λήψης: Αρχικά το φως που αντανακλάται από το αντικείμενο εισέρχεται στη μηχανή και διαπερνά πρώτα το φακό, μετά το διάφραγμα και στο τέλος καταλήγει στο σκοτεινό θάλαμο όπου υπάρχει το φιλμ.

Έτσι το αντικείμενο αποτυπώνεται πάνω στο φιλμ αλλά αντεστραμμένο.



The object lens diaphragm shutter film



The function of the lens

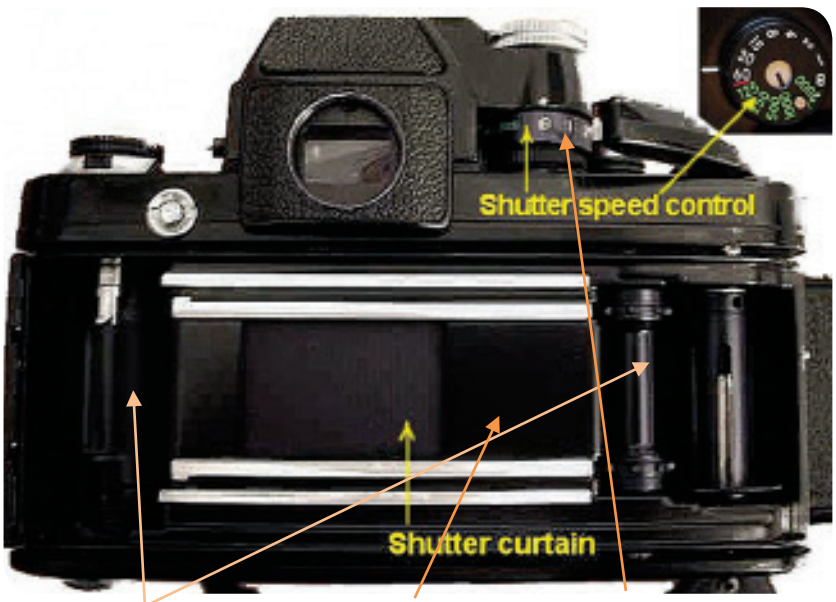
scribed the dark room of the camera. During the Renaissance artists painted with pencils or colors the outline of the picture and in that way they made the photograph. During the 16th Century a lens was placed in the small hole of the camera, which concentrated the sun light into the dark room and it improved the quality of the picture. In the 17th Century portable cameras were created, too. In addition in the same century an Italian physicist, Angelo Sala noticed that some silver salts were turned black by the sun light but he couldn't keep the tint of grey. In the 18th Century two Englishmen Thomas Wedgwood and Humphrey Davy used these chemical salts to print the outlines of faces, paintings, drawings etc.

The problem which existed at this time was the difficulty in the stabilization of the picture. So in 1827 the French physicist Joseph Niepce created a stable picture by using the dark room and a longer exposure time in the sun light and he named it "heliography". Despite Niepce's effort the picture was still blackened under the solar radiation. After Niepse's death, the physicist Dagger used plates of silver and sodium chloride as a stabilizer. His pictures were named "daguerreotypes". After a lot of research by the French and the English, someone found "collodi-

A photograph of the decades 1840 and 1850.

Ιστορική εξέλιξη

Η ιστορία της φωτογραφικής μηχανής ξεκινά ουσιαστικά από τα μέσα του 19ου αιώνα, παρόλο που κάποιοι υποστηρίζουν ότι έχει τις ρίζες της από τον αρχαίο ελληνικό πολιτισμό και σχετίζεται με τον σκοτεινό θάλαμο που είχε περιγράψει ο Αριστοτέλης. Κατά την Αναγέννηση ο καλλιτέχνης «περνούσε» με μολύβι ή χρώματα το ίχνος του ειδώλου χρησιμοποιώντας ουσιαστικά την αρχή λήψης φωτογραφιών. Κατά τον 16ο αιώνα τοποθετήθηκε στη μικρή οπή ένας συγκεντρωτικός φακός που βελτίωνε σημαντικά την ποιότητα του ειδώλου. Στη συνέχεια τον 17ο αιώνα



Restraint system of the film, shutter, shutter speed control

κατασκευάστηκαν και φορητοί θάλαμοι. Επίσης τον ίδιο αιώνα ο Ιταλός φυσικός Angelo Sala παρατήρησε ότι κάποια άλατα του αργύρου μαυρίζουν στο φως του ήλιου αλλά δεν μπόρεσε να διατηρήσει την απόχρωση του γκρι. Τον 18ο αιώνα οι Άγγλοι Thomas Wedgwood και Humphrey Davy χρησιμοποίησαν αυτά τα υλικά (χημικά άλατα) για να αποτυπώσουν περιγράμματα προσώπων, πινάκων ζωγραφικής κ.ά. Το πρόβλημα που υπήρχε όμως εκείνη την εποχή ήταν η δυσκολία σταθεροποίησης της εικόνας. Έτσι λοιπόν, το 1827, ο Γάλλος φυσικός Joseph Niepce δημιούργησε μία σταθερή εικόνα με τη χρήση σκοτεινού θαλάμου και αρκετά μεγάλο χρόνο έκθεσης και την ονόμασε heliographie (ηλιογραφία). Παρ' όλες τις προσπάθειες του Niepce η εικόνα συνέχιζε να μαυρίζει όσο έμενε εκτεθειμένη στην ηλιακή ακτινοβολία. Μετά το θάνατο του Niepce, ο φυσικός Ντάγκερ χρησιμοποίησε πλάκες αργύρου και χλωριούχου νάτριου για σταθεροποιητή. Οι εικόνες του ονομάστηκαν νταγκεροτυπίες.

Μετά από πολλές έρευνες Άγγλων και Γάλλων χημικών προέκυψε το κολλόδιο. Το κολλόδιο ήταν ένα υγρό, το οποίο μετά από πολλές βελτιώσεις χρησιμοποιήθηκε για την παραγωγή αρνητικών.

Μετά από χρόνια, το 1848-1860, οι Γάλλοι φυσι-

on". "Collodion" was a liquid which was used for the production of negatives. Between 1848 and 1860 the French physicists Alexandre Bequerel and Abel Niepce de Saint-Victor made the first color picture.

In 1883 the American George Eastman fabricated the negative film in the form of a tape and he created a company whose name was Kodak. It produced wound films like those we have today. With the spread of that type of film, a lot of people bought cameras and a lot of professional photographers and artists used them for their work.

The latest form of film

Nowadays cameras have evolved to a great extent. For many years the image continued to be made on a photosensitive surface, the film. The film consisted of billions of grains of crystallized silver. The light which fell on the film changed the chemical form of the grains. Each one of them contained information about the light which fell on it from the photographing of the object. That is to say that each grain had its own piece of information about the object. All together the grains had the image of the object on them. This technique is called analogue technology.

Digital cameras

Taking a photograph using a digital camera is different. Here, the details of an image are captured as numbers. The numbers are transformed into a picture with the help of a computer and a program which is installed inside the camera. The computer transforms the numbers into colours. The numbers are recorded on a surface which is also comprised of small dots which are called pixels. These pixels transform from light energy to electrical energy. In short, the light passes through the lens of the digital camera. After this it passes through three filters, red, green and blue. It then falls on the surface with the dots and finally it is transformed from light energy to electric energy and the minicomputer along with the program produces the photograph.

In general, with the passing of time the camera has evolved constantly and people invent new and improved ways of taking photographs.

The last form of the film

κοί Alexandre Bequerel και Abel Niepce de Saint-Victor δημιούργησαν την πρώτη έγχρωμη φωτογραφία.

One of the first Daguerreotype cameras.

Το 1883 ο Αμερικάνος George Eastman επινόησε το αρνητικό φιλμ με μορφή ταινίας και ίδρυσε την εταιρία Kodak, η οποία παρήγαγε τυλιγμένα φιλμ όπως είναι στη σημερινή του μορφή. Με τη διάδοση του τυλιγμένου φιλμ άρχισε η μαζική χρήση φωτογραφικών μηχανών και η απασχόληση για επαγγελματίες φωτογράφους και καλλιτέχνες.

Η τελευταία μορφή του φιλμ

Στη σημερινή εποχή οι φωτογραφικές μηχανές έχουν εξελιχτεί σε πολύ μεγάλο βαθμό. Για πολλά χρόνια η απεικόνιση της εικόνας εξακολουθούσε να γίνεται πάνω σε μία φωτοευαίσθητη επιφάνεια, το φιλμ. Το φιλμ, ωστόσο, αποτελούνταν από δισεκατομμύρια κόκκους κρυστάλλων αργύρου. Το φως που έπεφτε πάνω στο φιλμ άλλαζε τη χημική κατάσταση των κόκκων. Κάθε ένας από αυτούς περιείχε πληροφορίες για το φως που έπεφτε επάνω του από τη φωτογράφιση του αντικειμένου, δηλαδή, κάθε κόκκος είχε το δικό του κομμάτι πληροφορίας από το αντικείμενο. Όλοι μαζί οι κόκκοι είχαν αποτυπωμένο επάνω τους το αντικείμενο. Αυτή η τεχνική λέγεται αναλογική τεχνολογία.

Ψηφιακές μηχανές

Η λήψη φωτογραφιών με τη χρήση ψηφιακών μηχανών είναι διαφορετική. Εκεί οι λεπτομέρειες μιας εικόνας αποτυπώνονται ως αριθμοί. Αυτοί μετατρέπονται σε εικόνα με τη βοήθεια ενός υπολογιστή και ενός προγράμματος που είναι εγκατεστημένα στο εσωτερικό της φωτογραφικής μηχανής, όπου οι αριθμοί μεταφράζονται σε χρώματα. Οι αριθμοί καταγράφονται σε μια επιφάνεια που αποτελείται από μικρές κουκίδες, οι οποίες ονομάζονται εικονοστοιχεία (pixel). Αυτές μετατρέπουν το φως από φωτεινή ενέργεια σε ηλεκτρική. Με λίγα λόγια, το φως περνά από το φακό της ψηφιακής μηχανής. Στη συνέχεια περνά

Iconography

Fig. 1, 2, 3 and 4 The book of photography, John Hedgecoe, Edition Dorlins Kindersley, Revised Edition 2005.

Fig. 5 http://sfrang.com/historia/selida510.htm

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από τρία φίλτρα του κόκκινου, του πράσινου και του μπλε. Μετά πέφτει στην επιφάνεια με τις κουκίδες και τέλος μετατρέπεται η φωτεινή ενέργεια σε ηλεκτρική και ο μικροϋπολογιστής με το πρόγραμμα παράγουν τη φωτογραφία.

Γενικότερα, με το πέρασμα του χρόνου η φωτογραφική μηχανή εξελίσσεται συνεχώς και οι άνθρωποι επινοούν νέους και πιο βελτιωμένους τρόπους

A photograph of the decades 1840 and 1850

Catania 2012

"Ion Creanga"
National College

Brasov, Romania
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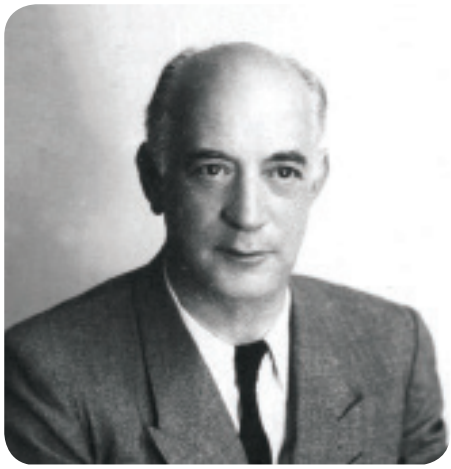
Reaction Engine

Motorul cu reacţie

by Elena Mihaela Vrabie



Henri Coanda - The inventor

Henri Coanda was a Romanian physicist and a great engineer. He is the one who has invented the reaction engine, unknown until the International Exhibition of Aeronautics, Paris-1910. From the multitude of the aviation pieces that were exposing then, the most interesting was represented by a red airplane, without propellers, with a plaque on which had been written: COANDA 1910.

Aircraft's engine was developing 50 horse-power at 1000 spins per minute. Piston-engine was connected at a rod, which was communicating with the compressor. The air which was absorbed through the front of the plane was thrown with high speed through the back of the plane. As Coanda said, the engine was thermic with piston: CLERGET, equipped with 4 cylinders, turbine, injectors and burners.

The appearance of the aircraft included a wooden fuselage, covered by painted and lacquered plywood, in order to oppose in air a little more resistance.

The fuselage was having a triangular section, rounded, and the direction elements were situated in the tail, which had the shape

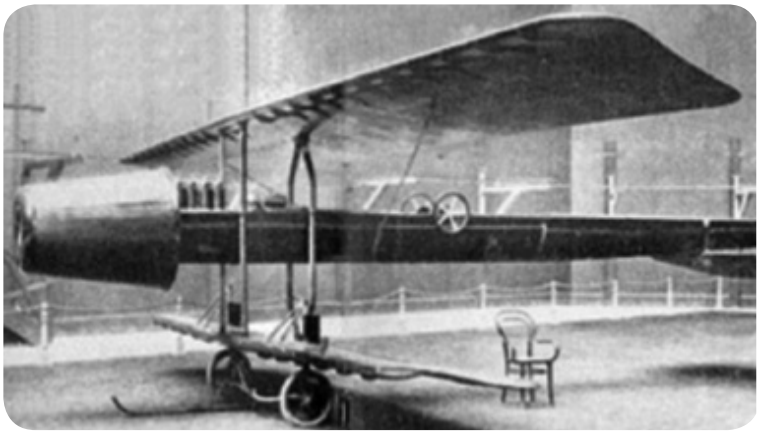
Henri Coandă a fost fizician si inginer român. El este cel care a inventat motorul cu reacţie, necunoscut până la Expoziţia Internaţională de Aeronautică din Marele Palat de pe Champs-Elisee din Paris, din anul 1910. Din multitudinea de piese de aviaţie expuse atunci, cea mai interesantă era reprezentată de un avion roşu, fără elice, cu o plăcuţă pe care scria: COANDĂ 1910.

Motorul avionului dezvolta 50 de cai putere la 1000 de rotaţii pe minut. Motorul-piston era conectat la o tijă care comunica cu compresorul. Aerul absorbit de compresor prin partea din faţă a motorului era aruncat cu mare viteză prin spatele lui. Astfel se producea efectul de reacţie. După declaraţiile lui Coandă, motorul era unul termic, cu piston: CLERGET, prevăzut cu 4 cilindri, turbină, injectoare şi arzătoare.

Aspectul exterior al avionului era conferit de fuselajul din lemn, acoperit cu placaj vopsit si lăcuit, pentru a opune in aer o rezistenţă cat mai mică. Fuselajul avea o secţiune triunghiulară rotunjită, iar elementele de direcţie erau situate in coada ce avea forma crucii Sfântului Andrei.

Henri Coandă a fost ajutat de Gustave Eiffel şi Paul Painlev în realizarea unui banc mobil pentru incercări aeronautice. Astfel, avionul cu reacţie a fost ridicat de la sol în data de 16 decembrie 1910 pe aerodromul Issy-les-Moulineaux, de lânga Paris. Aeronava COANDĂ 1910 a fost primul avion cu propulsie prin reacţie din lume.

Invenţia lui Henri Coandă a fost notificată de revistele «American Aviation» şi «Flying». Introdus in lumea internaţională, în anul 1911 el a devenit directorul tehnic al uzinelor de avioane «Bristol» din

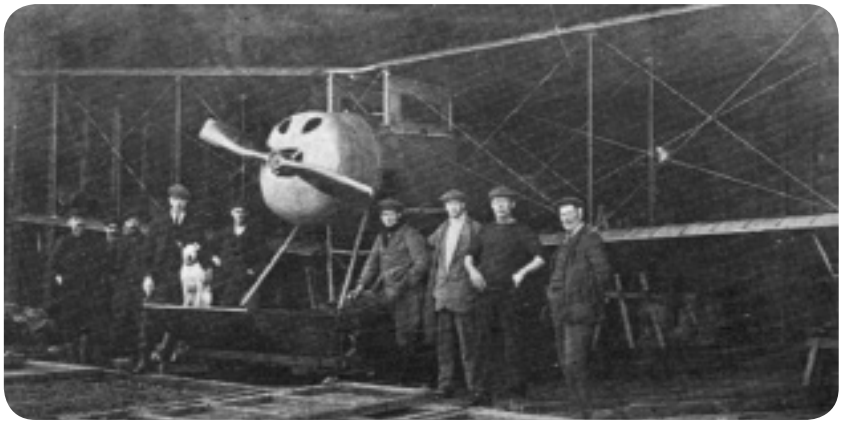


Coandă-1910 at the 1910 Paris Flight Salon

of the cross of Saint Andrew.

Henri Coanda has been helped by Gustave Eiffel and Paul Painlev in order to achieve a mobile bench for aeronautics trials. So, the reaction engine took off in 16 December 1910, on the Issy-les-Moulineaux airport, near Paris. The aircraft COANDA 1910 was the first airplane powered by reaction in the world.

Coanda's invention was notified by the magazines "American Aviation" and "Flying". So, in 1911 he became the technical director of the aircraft factories "Bristol", in England, for which he has constructed a lot of types of airplanes "Bristol-Coanda".



Aviation company «BRISTOL», England 1911.

The engineer and aircraft constructor Elie Carafoli said that: "The engineer Henri Coanda has offered the world a precious tool to walk through the air space: reaction engine, the first in the world".

Anglia, pentru care a realizat mai multe tipuri de avioane «Bristol-Coandă».

Inginerul constructor de aviane Elie Carafoli afirma că «Inginerul Henri Coandă a oferit omenirii un preţios instrument pentru străbaterea spaţiului aerian : avionul cu reacţie, primul din lume».

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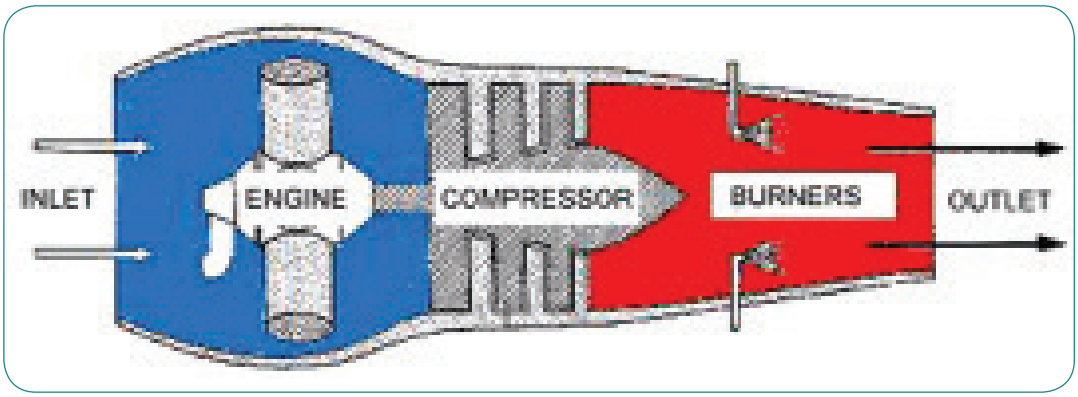

The mechanism
of the Reaction engine.

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The History of Helicopter

Η ιστορία του ελικοπτέρου

by Vasilios Apostoloudas

Helicopters are a useful means of transportation comparing to others because it does different things. Human always wants to be better and better. So, he discovered many ways to fly.

Mythology

An example is the myth of Daedalus and Icarus (father and son), who were imprisoned by King Minus of Knossos in a labyrinth, where the Minotaur lived. The labyrinth was made by Daedalus.

Daedalus made wings for him and his son with seagulls' feathers and wax. He advised his son not to fly too low, because the wax would freeze and he wouldn't be able to move his wings. Furthermore, he said his son not to fly high, because the wax would melt and the wings would break down.

They started flying and going away from Minus' castle. A few hours later, Icarus was delighted from the flight, but he flew so high, that the wax melted and he fell into the sea. His father named the island in the memory of his son. He established the island Icaria and the Icarian Sea.

Helicopter's history...

The history of helicopters began in 1861, when the French inventor Gustave de Ponta d' Amerkour invented the name "helicopter". He made a small steam machine, which was able to fly.

Leonardo da Vinci, with his famous design "Helical Airscrew", made the first attempt to construct the machine. He said: *I discovered that a machine like this, which is based on the principle of the screw, would take off, if it is rotated very fast*.

In 1754, the Russian scientist Michael Lomonosov proved the principle of swinging at the Russian Academy of Sciences. He took as a sample, a small flying device with a spring.

In 1783, Christian de Lonoua and Bieveni made a pair of coaxial propellers that rotate opposite to each other.

Το ελικόπτερο είναι ένα χρήσιμο μεταφορικό μέσο σε σχέση με τα υπόλοιπα μέσα μεταφοράς, γιατί κάνει διαφορετικά πράγματα.

Ο άνθρωπος, πάντα ήθελε και θέλει να γίνει καλύτερος. Έτσι από τα αρχαία χρόνια έκανε πολλές απόπειρες να πετάξει.

Μυθολογία

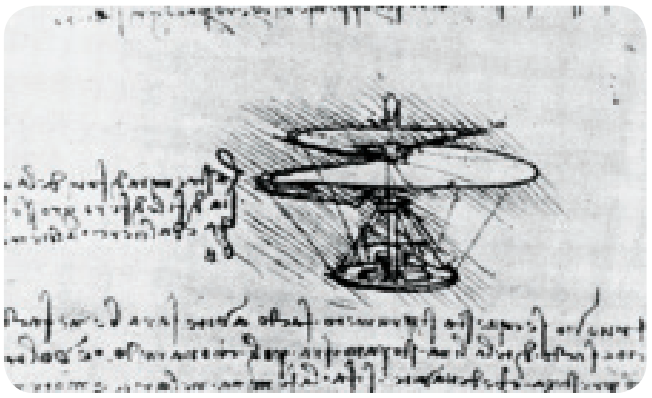
Ένα παράδειγμα είναι ο μύθος του Δαίδαλου και του Ίκαρου (πατέρα και γιου), που φυλακίστηκαν από το βασιλιά της Κνωσού Μίνωα στο λαβύρινθο που ζούσε ο Μινώταυρος και ήταν κτίσμα που το είχε χτίσει ο Δαίδαλος.

Έτσι, ο Δαίδαλος με τα φτερά από τους γλάρους και με το κερί, έφτιαξε φτερά για αυτόν και το γιο του. Συμβούλεψε το γιο του να μην πετάει πολύ χαμηλά, γιατί θα παγώσει το κερί και δε θα μπορεί να κουνήσει τα φτερά και να μην πετάξει ψηλά, γιατί θα λιώσει το κερί από τη θερμοκρασία του ήλιου και έτσι τα φτερά θα χαλάσουν.

Άρχισαν να πετούν και να απομακρύνονται από το παλάτι του Μίνωα. Μετά από ώρες, ο Ίκαρος γοητευμένος και αφηρημένος από την πτήση, ανέβηκε πολύ ψηλά και το κερί του έλιωσε και έπεσε στο πέλαγος. Ο πατέρας του προς τιμήν του ονόμασε το νησί που τον βρήκε Ικαρία και το πέλαγος που πνίγηκε Ικάριο.

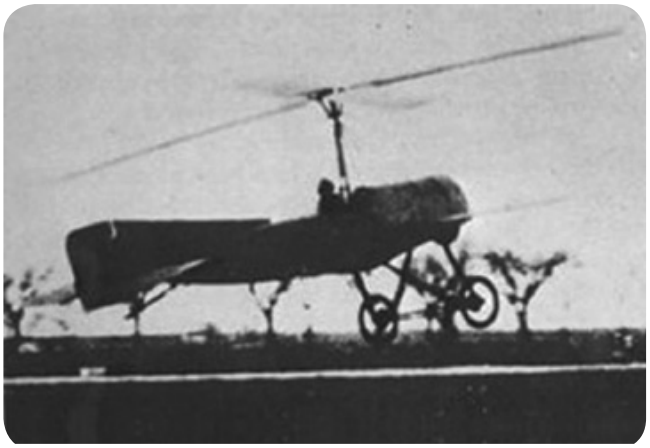
Η ιστορία του...

Η ιστορία του ελικόπτερου αρχίζει από το 1861, όπου ο Γάλλος εφευρέτης Γουστάβος ντε Ποντόν ντ' Αμερκούρ επινόησε την ονομασία «ελικόπτερο», έχοντας μία μικρή ατμοκίνητη συσκευή, ικανή να πετάξει.Ο Λεονάρντο ντα Βίντσι, με το διάσημο σχέδιό του



"Helical Airscrew", Leonardo da Vinci's design.

«Ελικοειδής Αεροκοχλίας», έκανε την πρώτη προσπάθεια κατασκευής ελικόπτερου. Ο ντα Βίντσι γράφει για τη συσκευή: *Ανακάλυψα ότι μία συσκευή σαν κι αυτή, βασισμένη στην αρχή του κοχλία, θα απογειωθεί στον αέρα, εφόσον περιστραφεί πολύ γρήγορα*.Το 1754, ο Ρώσος επιστήμονας Μιχαήλ Λομονόσοφ απέδειξε την αρχή της αιώρησης στη Ρωσική



The first autogyro which had a successful flight

This period many types of helicopters were released and powered by steam or springs. On November 13, 1907, Paul Corny (bicycle manufacturer) manufactured a helicopter that was able to transport people. The first flight lasted 15´´ in 60cm height.

In 1920, the Spanish engineer Juan de la Thierva built the "autogiro", the ancestor of the helicopter. The autogiro is like helicopter and airplane, simultaneously. The first successful flight show took place at the airport "Kouatro Vientos" on January 9, 1923.

On 14 September 1940 the first flight of the Vought-Sikorsky VS-300 was made by Igor Sikorski. It had one helix with three blades and the engine power was 75 HP. The first flight without fetters was on May 13, 1940. It was the first helicopter in its today widespread form.

Modern helicopters have made significant progress in agility, speed, autonomy and height. The advantage of the helicopter is that it can remain stationary and swing to one spot for a long time.

Helicopter's use through time...

In the past it was used to transfer messages from Europe-America and vice versa.

Nowadays, it is used in many missions such as research tracking and rescuing, fire fighting, transportation for people who need urgent surgery, where their places do not have airport. To help sick people who are at risk in inaccessible places, (earthquake victims, mountain climbers, isolated military etc..), basting several areas with insecticides, transportation of politicians etc. Helicopters are very useful in small islands and generally in areas that are isolated from the rest of the world. In Greece this is very important because there are many isolated islands where only helicopters can serve for urgent needs and airlift people for health matters, child births, etc.

When there is a war helicopters can carry supplies and aid into difficult spots, can help in the

Ακαδημία Επιστημών. Είχε ως δείγμα μία μικρή συσκευή που πετούσε με ένα ελατήριο.

Το 1783, ο Κριστιάν ντε Λονουά και ο Μπιεβένι κατασκεύασαν ένα ζεύγος ομοαξονικών ελίκων, που περιστρέφονται ο ένας αντίθετα στον άλλο.

Η περίοδος αυτή είχε πολλά μοντέλα ελικόπτερων που κυκλοφόρησαν και κινούνταν με ατμό ή ελατήρια. Στις 13 Νοεμβρίου του 1907, ο Πωλ Κορνί (κατασκευαστής ποδηλάτων) κατασκευάζει ελικόπτερο ικανό να μεταφέρει ανθρώπους. Η πρώτη πτήση είχε διάρκεια 15´´ και ύψος 60 εκ.

Το 1920, ο Ισπανός μηχανικός Χουάν ντε λα Θιέρβα κατασκεύασε το αυτόγυρο, ο άμεσος απόγονος του ελικόπτερου. Το αυτόγυρο είναι μεταξύ ελικόπτερου και αεροπλάνου. Η πρώτη επιτυχημένη επίδειξη έγινε στο αεροδρόμιο «Κουάτρο Βιέντος» στις 9 Ιανουαρίου του 1923.

Στις 14 Σεπτεμβρίου του 1940, πέταξε για πρώτη φορά το Vought-Sikorsky VS-300, του Ίγκορ Σικόρσκι. Είχε έναν έλικα με τρεις λεπίδες και ο κινητήρας του είχε ισχύ 75 ίππους. Η πρώτη πτήση του χωρίς δεσμά έγινε στις 13 Μαΐου του 1940. Ήταν το πρώτο ελικόπτερο που έφερε τη διαδεδομένη μέχρι σήμερα διαμόρφωση.

Το σύγχρονο ελικόπτερο, σημείωσε σημαντικές προόδους ως προς την ευκινησία, την ταχύτητα, την αυτονομία και το ύψος. Τα πλεονεκτήματα του ελικοπτέρου είναι ότι μπορεί να μένει ακίνητο αιωρούμενο σ' ένα σημείο για πολλή ώρα.

UH-19D: That was one of the first helicopters which entered to service
with the Armed Forces of Greece in 1958

Η χρήση του μέσα στα χρόνια...

Παλιά το χρησιμοποιούσαν για μεταφορά μηνυμάτων από Ευρώπη-Αμερική και αντίστροφα.

Σήμερα το χρησιμοποιούμε σε πολλές αποστολές: όπως έρευνες εντοπισμού και διάσωσης, κατάσβεση πυρκαγιών, μεταφορά αρρώστων που χρειάζονται επείγουσα

detection and transfer of information. Modern military helicopters are equipped with night-sight and anti-tank systems which are very effective in battles of air to attack territorial objectives.

Helicopters have been developed so much that tend to replace airplanes in some areas, especially to those cases that are related to military purposes.

Differences between helicopter and airplane

- helicopter's buoyancy requires the movement of its rotor's flaps, but the airplane has stable flaps.
- helicopter has the ability to move in every direction or even to swing (almost) motionless on air, in contrast the airplane moves only forward
- helicopter's elevation and flight do not demand horizontal movement as the majority of airplanes.

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- Fig.4: http:\\ellinika-ftera.blogspot.gr/2010/06/super-puma-2011-2012.html

Super Puma.

επέμβαση και δεν υπάρχει αεροδρόμιο, για παροχή βοήθειας σε ανθρώπους που κινδυνεύουν σε δυσπρόσιτα μέρη, (σεισμόπληκτους, ορειβάτες, απομονωμένους στρατιώτες κτλ.), ράντισμα διάφορων περιοχών με εντομοκτόνα, μεταφορά πολιτικών προσώπων, κ.α.

Τα ελικόπτερα είναι πολύ χρήσιμα στα μικρά νησιά και σε περιοχές γενικότερα, που είναι αποκομμένες από τον υπόλοιπο κόσμο. Στην Ελλάδα αυτό είναι πολύ σημαντικό γιατί υπάρχουν πολλά απομονωμένα νησιά, όπου μόνο τα ελικόπτερα μπορούν να εξυπηρετήσουν επείγουσες ανάγκες αερομεταφοράς (κυρίως θέματα υγείας, ατυχήματα, τοκετοί κτλ.).

Όταν υπάρχει πόλεμος, μεταφέρει εφόδια και ενισχύσεις σε δύσκολα σημεία, βοηθάει στην ανίχνευση, παρακολούθηση, μεταβίβαση πληροφοριών.

Υπάρχουν ελικόπτερα του Πολεμικού Ναυτικού αλλά και μαχητικά ελικόπτερα. Τα σύγχρονα πολεμικά ελικόπτερα εξοπλισμένα με νυκτερινά συστήματα σκόπευσης και με αντιαρματικούς πυραύλους είναι πολύ αποτελεσματικά σε μάχες αέρος-εδάφους κατά τεθωρακισμένων.

Το ελικόπτερο έχει εξελιχθεί σε τέτοιο βαθμό που τείνει να αντικαθιστά το αεροπλάνο σε ορισμένους τομείς, ειδικά αυτούς που αφορούν στρατιωτικούς σκοπούς.

Οι διαφορές ανάμεσα στο ελικόπτερο και το αεροπλάνο

- στο ελικόπτερο η άνωση οφείλεται στην κίνηση των πτερυγίων του στροφείου, ενώ το αεροπλάνο έχει σταθερά πτερύγια
- το ελικόπτερο έχει τη δυνατότητα να κινείται προς κάθε κατεύθυνση, ή ακόμα και να αιωρείται (σχεδόν) ακίνητο στον αέρα, σε αντίθεση με το αεροπλάνο που κινείται μόνο προς τα εμπρός
- για την ανύψωσή και πτήση του δεν απαιτείται

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FUN PAGE

9 Hidden Words

by Anastasia Tsavlidou

O	C	E	A	N	O	G	R	A	P	H	Y	Q
D	H	A	J	E	N	L	Z	G	N	J	D	W
S	E	R	M	F	Y	F	B	V	C	F	B	E
X	M	P	K	B	O	T	A	N	Y	T	C	R
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Y	O	P	H	Y	S	I	C	S	F	S	B	P
R	J	H	N	L	Y	K	O	H	J	R	N	A
M	E	T	E	O	R	O	L	O	G	Y	M	S
A	S	G	H	W	P	S	O	S	F	J	L	D
C	O	S	M	O	L	O	G	Y	H	C	K	F
K	L	A	S	D	F	G	Y	H	Z	X	J	G

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Meteorology
Cosmology
Botany
Biology

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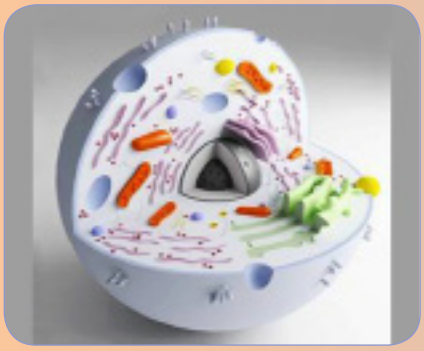
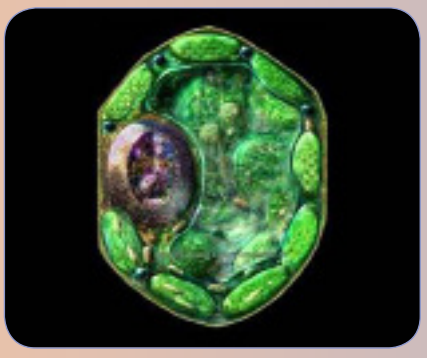
FUN PAGE

Find the relations

by Epaminondas Drakakis

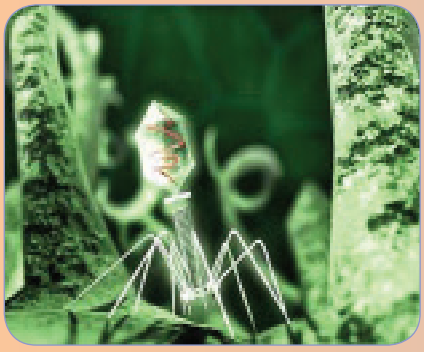


A. Animal cell

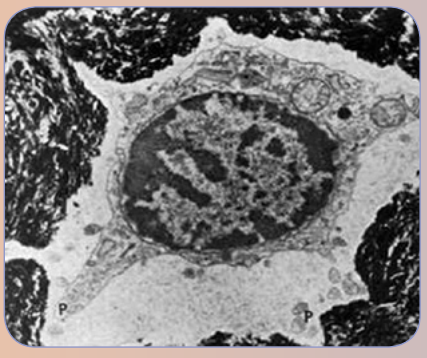


B. Plant cell

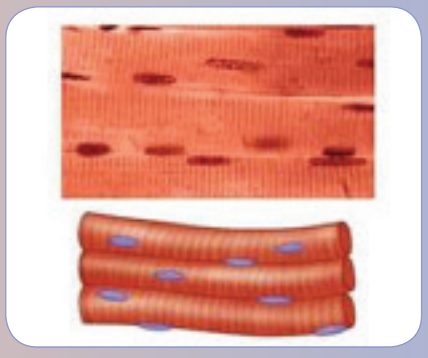
C. Bacteria



D.Virus

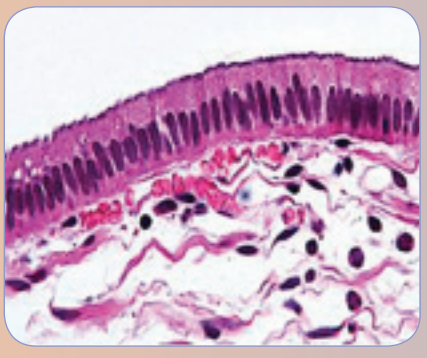


E. Osteocyte

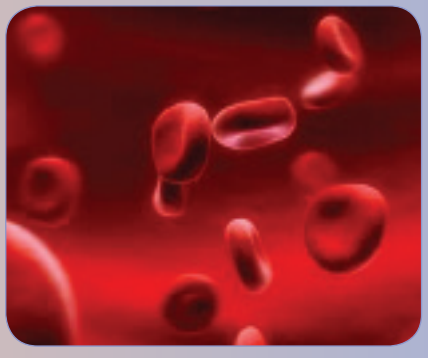


F. Muscle Fibers

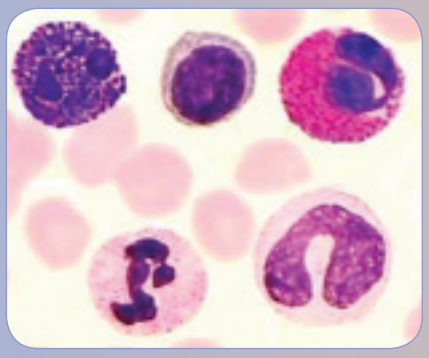
G. Neurons



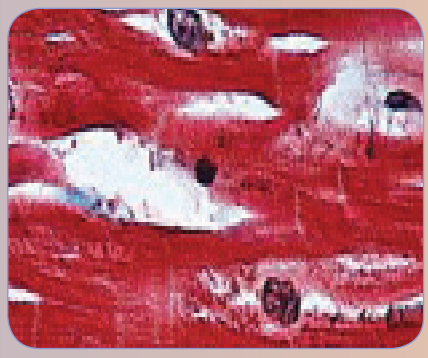
H. Epithelial cells



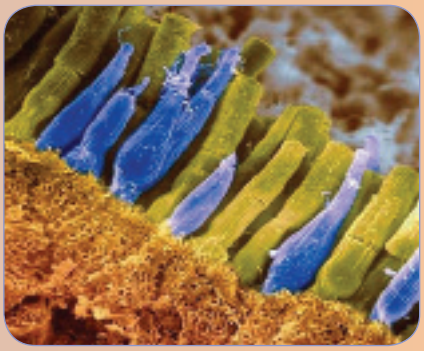
I. Erythrocytes



J. Leukocytes



K. Cardiac muscle fibers



L. Rods & Cones cells

1. These cells carry information from one part of the body to another. They possess in common a large number of short processes called “dendrites” and a single process called “axon”.
2. In the Latin means “poison”. It causes many diseases. Some of them are influenza, herpes and AIDS. They are parasites that can only develop inside living cells.
3. These cells are surrounded by a cellulose cell wall.
4. Blood cells that defend our bodies fighting the bacteria and the harmful substances. These cells occur in a wide variety of shapes and sizes.
5. The tissues and the organs of an animal’s body consist of these cells.
6. These cells come in three forms:
   a) Mature cells
   b) Cells responsible for bone formation
   c) Cells responsible for bone destruction
7. Some of these microorganisms are helpful but others can cause a disease under suitable conditions.
8. These cells called Fibers containing many nuclei. They are specialized for contractions and they can reach up to 12cm or more in length.
9. Blood cells specialized for oxygen transport. They contain hemoglobin that is responsible for the blood’s red colour.
10. Layers of cells that line the cavities in the body and also make up the outer surface of the body. These may be flat, cuboidal or columnar.
11. Light sensible cells of the retina responsible for the detection of light. They used mostly for night vision.
    Light sensible cells responsible for the detection of colour. They used mostly for day vision.
12. These muscle fibers branched to form a delicate network. They are look like skeletal muscle fibers but they are not under conscious control.

Κ	Λ	Η	Ι	Ζ	Θ	Ε	Α	Γ	Β	Δ	Θ
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FUN PAGE

Instruments and Units in Physics

by Anastasia Tsavlidou

1. Which is the instrument we measure voltage?
a) Ammeter c) Ammeter
b) Voltmeter d) Ohmmeter

2. Which is the instrument we measure resistance?
a) Voltmeter c) Ammeter
b) Ohmmeter d) Multimeter

3. Which is the instrument we measure intensity?
a) Voltmeter c) Ohmmeter
b) Ammeter d) Ammeter

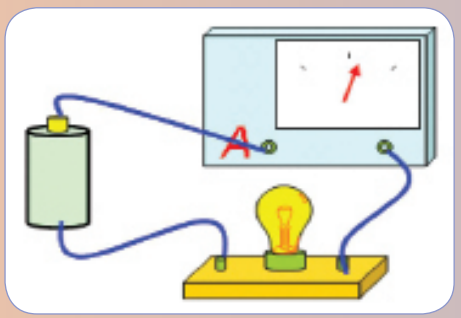
4. Which is the instrument we measure force?
a) Voltmeter c) Ohmmeter
b) Wattmeter d) Ammeter

5. The voltage is measured in:
a) Ampere c) Volt
b) Ohm d) Watt

6. The intensity is measured in:
a) Ohm c) Watt
b) Ampere d) Volt

7. The resistance is measured in:
a) Ampere c) Watt
b) Volt d) Ohm

8. The force is measured in:
a) Volt c) Watt
b) Ampere d) Ohm



1. b 2. b 3. b 4. b 5. c 6. b 7. d 8. c

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Impact of the industrial robots in human life

Impactul roboților industriali în viața oamenilor

by Flavius Bejan

1. Introduction

When we hear the word „robots", the first thing that comes in our mind are the movies where the robots are the enemy of humans and are trying to get rid of us. Many think of them as powerful, very smart machines, which looks a lot like humans and want to destroy us, but fortunately only some of these things are true. Robots are very powerful and smart machines, some of them resembling us, but they don't present any danger, of the contrary, they are of great help to us making our lives easier.

The appearance of robots was a big step in the evolution of science, but of live also. They can help us in almost every domain.

Thus, in hospitals where they can help the doctors in operating room, or replace a limb for a person that has lost it, for example a person that has lost his arm could get an artificial one that can be moved with the help of his brain.

In the military fields where they can defuse bomb, go on recon, like the one in Fig.1, or be used as a decoy.

In space where you need the help of a robot hand to position and hold objects, for example the

Fig. 1. A drone used by the army to go on recon, surveillance and other missions that require a great stealth

1. Introducere

Când auzim cuvântul „robot", primul lucru care ne vine în minte sunt filmele unde roboții sunt inamicii oamenilor și încearcă să scape de noi. Mulți se gândesc la ei ca la niște mașinării puternice și foarte inteligente, care seamănă foarte mult cu oamenii și încearcă să scape de noi, dar din fericire doar o parte din aceste lucruri sunt adevarate. Roboții sunt mașinării foarte puternice și inteligente, unii asemănându-ne foarte mult, dar aceștia nu prezintă nici un pericol, ba din potrivă, aceștia ne sunt de mare ajutor făcându-ne viața mai ușoară.

Apariția roboților a fost un pas important în evoluția științei, dar și a vieții. Aceștia ne pot ajuta în aproape orice domeniu.

Astfel, în spitale unde pot ajuta doctorii în sălile de operație, sau să înlocuiască membrul unei persoane care l-a pierdut, de exemplu o persoană care și-a pierdut brațul ar putea primi unul artificial care poate fi mișcat de creierului său.

In domeniul militar unde aceștia pot dezamorsa bombe, merge în recunoaștere, precum cel din Fig.1, sau să fie folosiți ca momeala.

În spațiu unde ai avea nevoie de ajutorul unei mâini robotice pentru a poziționa sau a ține obiecte, de exemplu brațul navetei spațiale Discovery care e folosit pentru a muta modulele pentru stația spațială sau pentru a înlocui celulele fotovoltaice ale sateliților.

Un domeniu foarte important este industria unde roboții pot construi, asambla, dezasambla, vopsi, suda, muta obiecte grele, sau pot fi folosiți în spațiu, pe fundul oceanului pentru explorare, în agricultură, mine, construcția de case, și așa mai departe [1]. În [2] sunt discutate anumite aspecte despre roboții industriali, dar nu este analizat împactul acestora asupra vieții umane.

Acest articol se ocupă cu istoria roboților industriali, care a fost primul robot industrial din Europa, din ce sunt formați, cum se miscă, dar de asemenea unde îi putem întâlnii.

2. Istoria roboților industriali

Primul robot industrial din Europa a fost creat de George Devol și Joseph Engelberger în 1959 și a fost numit UNIMATE. Greutatea sa era de aproximativ 2 tone și se putea mișca cu ajutorul unor servomotoare hidraulice care erau controlate de un program scris pe un tambur magnetic.

Unimate a fost folosit pentru prima dată pe o linie de producție la General Motors Ternstedt, din Trenton, New Jersey, care se ocupă cu producerea de mânere pentru uși și geamuri, mânererul pentru schimbătorul de viteze, corpuri de iluminat și alte componente pentru interiorul automobilelor. Roboții erau folosiți pentru secvențiere și suprapunerea pie-

Discovery space shuttle arm, which is used for moving modules for the space station or to replacing the photovoltaic cells of satellites.

A very important domain is industry where the robots can construct, assemble, dissemble, paint, weld, move heavy objects, or can be used in space, on the bottom of the sea for exploration, in agriculture, mines, house building, and so on [1]. In [2] some aspects on industrial robots are discussed, but their impact on human life isn't analyzed.

This article deals with the history of industrial robots, which was the first industrial robot in Europe, from what they are formed, how they move, but also where we can meet them.

2.The history of industrial robots

The first industrial robot in Europe was made by George Devol and Joseph Engelberger in 1959 and it was named UNIMATE. His weight was about 2 tons and he could move with the help of the hydraulic actuators which were controlled by a program written on a magnetic drum.

Unimate was used for the first time on a production line at General Motors Ternstedt, from Trenton, New Jersey, which was dealing with the productions of door and windows handles, gear shift knobs, light fixtures and other hardware for automotive interiors.

The robot was used for sequencing and stacking hot pieces of diecast metal. In 1969 the GM factory used the industrial robots in proportion of 90% for the operations of body welding.

In 1969 UNIMATION, the company of George Devol and Joseph Engelberger, signs a licensing agreement for creating and selling on the Asian market of the Unimate robots with those from Kawasaki Heavy Industries, Japan, which created later that year the first Japanese industrial robot, Kawasaki-Unimate 2000, shown in Fig. 2.

In 1973 the German company KUKA creates Famulus, the first industrial robot which had 6 electromechanically driven axes.

In 1974 appears the first industrial robot that was controlled by a minicomputer, and it was called T3.

Also in this year, ASEA, from Sweden, creates IRB-6, the first industrial robot which functioned only on electric current. IRB-6 was controlled by an Intel 8-bit microprocessor, which could mimic the motion of the human hand because of its 5 axes and could support a weight up to 6 Kg.

In 1979 the Japanese company Nachi creates the first robots that were put in motion by an electromotor.

In 1985 KUKA presents the first robot which shape was like a „Z". This new shape occupies less space and allows a complete flexibility on all 6 axes of rotation [2].

selor fierbinți de metal turnat sub presiune. În 1969 fabrica GM a folosit roboții industriali în proporție de 90% pentru operațiunea de sudare a caroseriei.

În 1969 UNIMATION, compania lui George Devol și Joseph Engelberger, semnează un acord de licență, pentru crearea și vinderea pe piața asiatică a roboților Unimate, cu cei de la Kawasaki Heavy Industries, Japonia, care a creat un an mai târziu primul robot industrial Japonez, Kawasaki-Unimate 2000, prezentat în Fig. 2.

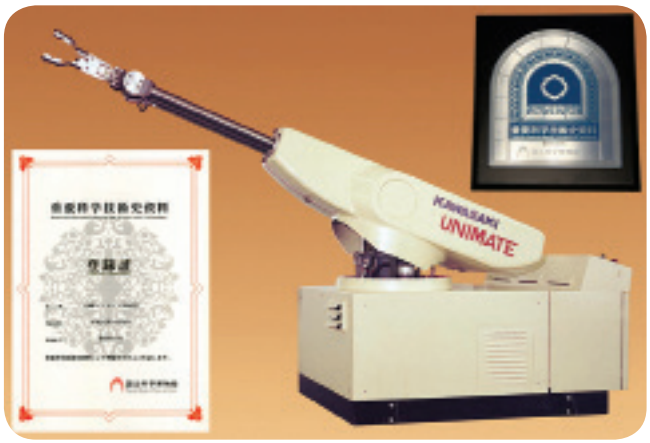


Fig. 2. The first Japanese industrial robot, Kawasaki-Unimate 2000

În 1973 compania German KUKA crează Famulus, primul robot industrial care a avut 6 axe mișcate electromecanic.

În 1974 apare primul robot industrial care era controlat de un minicomputer, și a fost numit T3. De asemenea în acest an, ASEA, din Sweden, crează IRB-6, primul robot industrial care funcționa doar pe curent electric. IRB-6 era controlat de un microprocesor Intel de 8-bit, care putea imita mișcarea mâinii umane din pricina celor 5 axe și putea suporta o greutate de până la 6 Kg.

În 1979 compania Japoeza Nachi crează primul robot care era pus în mișcare de un electromotor.

În 1985 KUKA prezintă primul robot a cărui formă era ca unui „Z". Această nouă formă ocupă mai puțin spațiu și permite o flexibilitate completă pe toate cele 6 axe de rotație [2].

3. Din ce e făcut?

Pentru mulți dintre noi un robot industrial este făcut dintr-o mână care face toată treaba, cea ce nu este adevărat. Robotul este format dintr-un controler care-i comandă mișcarea, un braț care reprezintă în aproape toate cazurile unul uman, un umăr, un cot, o încheietură și clești care sunt ca niște degete pentru el, sau poate avea în schimb o pompă de vid, pensete, un bisturiu, o lampă de sudură sau un spray de vopsea. În fiecare articulație acesta are un „motor" care este pus în mișcare de presiunea aeru-

3. From what is made?

For many of us an industrial robot is made from a hand that does all the work, which is not true. The robot is made from a controller that commands its movement, an arm which in almost all cases resemblances the human one, having a shoulder, an elbow, a wrist and grippers which are like fingers to him, or he can have instead a vacuum pump, tweezers, scalpel, blowtorch or a painter. In each joint he has a „motor" which is put in motion by the pressure of the air, the water, the oil or by electricity [4]. Some of them can be equipped with sensor which gives the controller a feedback in the case if something isn't there or if something appears in his radius, allowing the controller to change the way the robot moves or stop it to avoid any danger and announce the problem [2], [5].

4. How it moves?

With today's technology the industrial robots can have a repeatability radius of ±0.015mm, allowing you to put the same piece in the same place at a very small difference compare to the previous one [6]. They can move on all 6 degrees of freedom, which means they could go on horizontal, on vertical, on depth and can rotate on the OX, OY and OZ axes. This freedom if given by the robots number of joints, represented in Fig. 3.

By rotating on A1 axis, the arm will move from left to right like you are turning standing still, on A2 the arm will move back and forth like leaning, on A3 it will move up and down like the head when looking at something that moves, on A4 it will rotate on OX like an arm when flipping a card, on A5 it will rotate on OY, moving up and down like a writs and on A6 it will move also like on A4, but this allows the robot to turn in a tighter space. The rotation on OZ is done by rotating on A6 when the axis it's positioned vertically.

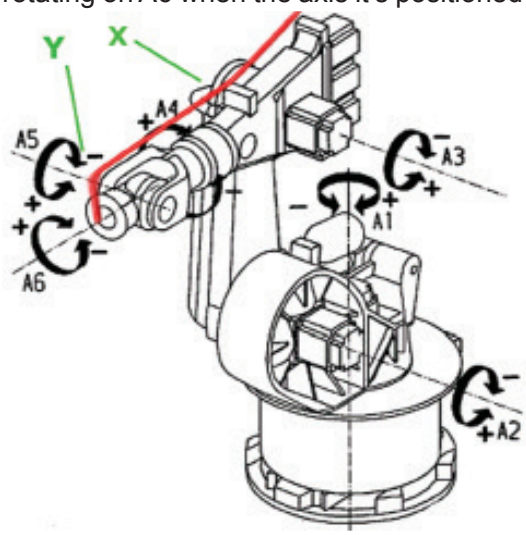


Fig. 3. The representation of the 6 axes of rotation

lui, apei, uleiului sau de electricitate [4]. Câțiva dintre ei pot fi echipați cu senzori care oferă controlerului un feedback în cazul în care ceva nu este acolo sau dacă ceva care apare în raza sa, permițându-i controlerului să schimbe felul în care robotul se mișcă sau să-l oprească pentru a evita orice pericol și să anunțe problema [2], [5].

4. Cum se mișcă?

Cu technologia de azi, roboții industriali pot avea o rază de repetabilitate de ±0.015mm, permițându-i să așeze aceași piesă în același loc la o diferență foarte mică comparativ cu precedenta [6]. Aceștia se pot mișca pe toate cele 6 grade de libertate, cea ce înseamnă că aceștia se pot mișca pe orizontală, verticală, în adâncime și se poate roti pe axele OX, OY si OZ. Această libertate este oferită de numărul articulațiilor ale robotului, reprezentat în Fig. 3.

Rotindu-se pe A1 brațul se va mișca de la stânga la dreapta precum tu te-ai roti stând pe loc, pe A2 brațul se va mișca înainte și înapoi precum aplecarea, pe A3 se va mișca în sus și jos precum capul când te uiți la ceva ce se mișcă, pe A4 se va roti pe OX precum un braț care întoarce o carte, pe A5 se va roti pe OY, mișcându-se în sus și jos precum o încheietură și pe A6 se va mișca de asemenea ca pe A4, dar aceasta permite robotului să se rotească într-un spațiu mai strâmt. Rotația pe OZ este realizează prin rotirea pe A6 când axa este poziționată vertical.

Deci, teoretic, cu cât mai multe articulații cu atât mai bine, dar acest lucru este bun doar dacă robotul operează în spații strâmte și manevrează o sarcină mică. Dacă robotul operează cu sarcini mari și are un numar mare de articulații acesta poate ceda, deci în acest caz, cu cât mai puține articulații cu atât mai bine.

Mișcarea robotului e determinată de un program pe care operatorul îl introduce în controlerul robotului. Programul controlează fiecare „motor" din articulațile sale, mutându-l în locația definită. Când robotul execută toți pașii din program, acesta pornește din nou de la început, făcând-l să facă același lucru din nou și din nou „precum un robot".

Acesta este un exemplu de instrucțiuni pe care robotul le ia pentru a-și îndeplini sarcinile [7]:

1. Mișca-te deasupra spațiului de lucru.
2. Apropie-te de obiect la o distanță de 5 cm.
3. Poziționează-te deasupra obiectului.
4. Prinde obiectul.
5. Îndepărtează-te de obiect la o distanta de 5 cm.
6. Mișcă-te către spațiul de aruncare.
7. Apropie-te de spațiul de aruncare la o distanță de 5 cm.
8. Eliberează obiectul.
9. Îndepărtează-te de spațiul de aruncare la o distanță de 5 cm.

So, theoretically, the more joints the better, but this is good only if the robot operates in tight spaces and handles a small load. If the robot operates with heavy loads and has a big number of joints he can fall apart, so in this case the less joints the better.

The movement of the robot is determined by a program that the operator introduces it in the robots controller. The program controls every „motor" from his joints, moving him to the defined location. When the robot executes all the steps from the program, this starts again from the beginning, making the robot doing the same thing again and again „like a robot".

This is an example of the instructions that the robot takes to fulfill his task [7]:

1. Move above the working space.
2. Approach the object at a distance of 5 cm.
3. Position yourself above the object.
4. Grab the object.
5. Get back from the object at a distance of 5 cm.
6. Move to the dropping space.
7. Approach the dropping space at a distance of 5 cm.
8. Release the object.
9. Get back from the dropping space at a distance of 5 cm.
10. Start from the beginning.

5. Where are they used?

The industrial robots are mainly used in factories doing complex operations which would take too long, require an incredible finesse or are too heavy for a human to make.

A place where we will find robots is in an electronics factory, where placing the small chips on their exact place couldn't be done by any human at a slow speed. In this case the robot can do the work much better and at a high speed, at about 7 m/s.

Another place where we will find them is in an automobile factory, where they will do body welding (Fig. 4) much better and faster than a person, assuring the manufactures that the body is much tougher and in a case of an accident the automobile will resist much better, or they can paint the body more precisely, much faster and efficiently, reducing the quantity of paint used, or they can turn it upside down, move it, or help the employees to place the engine and other components inside it.

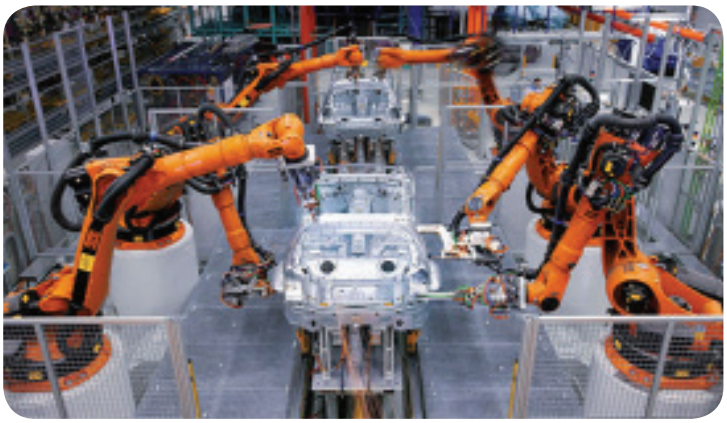


Fig. 4. Industrial robots welding the body of an automobile

10. Pornește de la început.

5. Unde sunt folosiți?

Roboții industriali sunt folosiți în mare parte în uzine făcând operații complexe care ar dura prea mult, ar necesita o finețe incredibilă sau sunt prea grele pentru ca un om să le facă.

Un loc în care vom găsi roboți este într-o fabrică de electronice unde poziționarea cipurilor micuțe în poziția lor exactă nu poate fi realizată de nici un om la o viteză mică. În acest caz robotul poate face o treabă mult mai bună și la o viteză mai mare, aproximativ 7 m/s.

Un alt loc unde-i vom găsi este la o fabrică de automobile unde aceștia realizează suduri de caroseri (Fig. 4) mult mai bine și mai rapid decât o persoană, asigurând producătorii că, caroseria este mult mai rezistentă și că în caz de accident automobilul va rezista mult mai bine, sau pot vopsi caroseria mult mai precis, mai rapid și eficient, reducând cantitatea de vopsea folosită, sau o pot răsturna, mișca, sau să-i ajute pe angajați să poziționeze motoare și alte componente în interiorul acestora.

În figura de mai sus putem observa cum roboții sudează caroseria mașini în puncte strategice pentru a o face mai sigură.

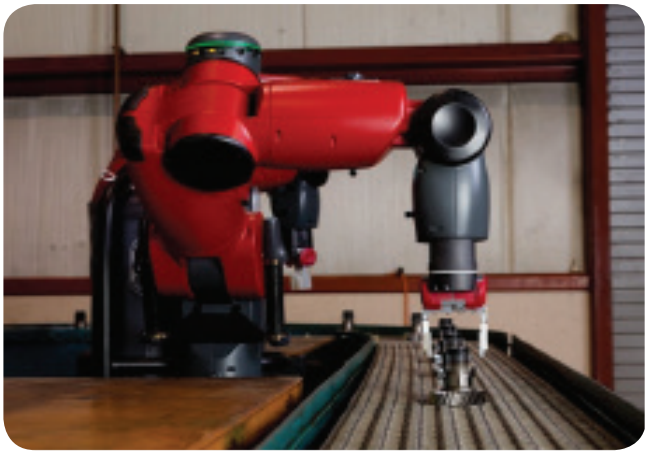
Aceștia sunt folosiți de asemenea pentru a muta piese fierbinți, care sunt prea greu de manevrat și foarte periculoase pentru muncitori, pentru a suprapune sticle de suc, muta dulciuri de la o stație de lucru la alta și multe alte scopuri.

Pro-urile pentru a utiliza roboții industriali sunt că aceștia reduc contactul cu pericolele, cu mediile agresive și toxice, reduc munca grea realizată de oameni, aceștia pot creste precizia în procesul tehnologic, pot face treburi repetitive la o viteză mult mai mare și pot reduce erorile umane.

Contra-urile pentru a utiliza roboții industriali sunt că aceștia reduc numărul locurilor de muncă, au nevoie de mentenanță constantă, sunt scumpi, consumă energie, au un număr limitat de funcții, dacă apare o defecțiune, aceasta poate duce la accidente, dacă curentul este tăiat, aceștia devin nefolositori.

6. Concluzie

În ciuda unor credințe, roboții industriali sunt una dintre cele mai mari invenții care au făcut viața modernă posibilă făcând procesul de



In the above figure we can see how the robots are welding the body of the car in strategic points to make the car safer.

They are also used at moving hot pieces, which can be too hard to handle and very dangerous for the workers, for stacking bottles of soda, moving candies from a work station to another and many other purposes.

The pros for using the industrial robots are that they reduce the contact with dangers, aggressive and toxic environment, they reduce the heavy work done by humans, they can increase the precision in the technological processes, they can do repetitive jobs at a higher speed and reduce the human errors.

The cons for using the robots is that they reduce the number of jobs, they need constant maintenance, they are expensive, consume energy, they have a limited number of functions, if a malfunction appears, this could lead to accidents, if the power is cut, they are useless.

6.Conclusions

Despite some beliefs, the industrial robots are one of the greatest inventions that made the modern life possible by making the production process of the objects and products that we use daily much faster, easier, more efficient and safer for the workers and also for the consumers.

Now it's up to you to decide if the industrial robot is one of the best inventions which aren't present in our daily life, but it is present behind the process of creation of our daily use objects, which makes life much easier.

producție al obiectelor și produselor pe care le folosim în fiecare zi mult mai rapid, mai usor, mai eficient și sigur pentru muncitori și de asemenea pentru consumatori.

Acum este alegerea ta dacă robotul industrial este una dintre cele mai bune invenții care nu este prezent în viața noastră de zi cu zi, dar este prezent în spatele procesului de creare a obiectelor pe care le folosim, făcând viața mult mai ușoară.

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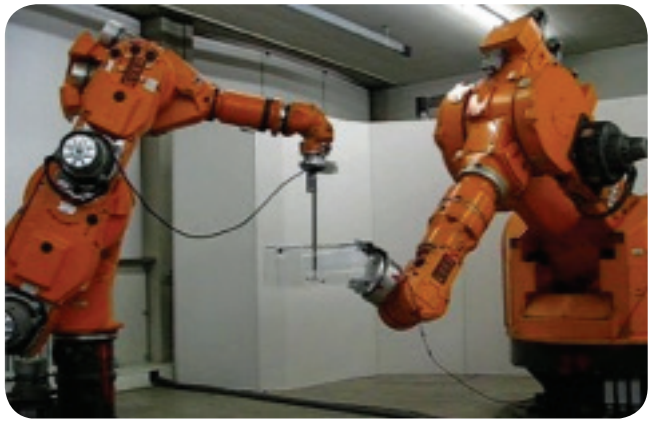

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