Two Year Degree Plan Suggested

By Bob Morrison

A plan that would allow Caltech students to leave school after two years with an Associate Science degree (AS) has been suggested by two Mathemicians, Profs. Richard Dean and Gary Lorden.

At the moment, the idea is only being discussed informally. The plan would be aimed at those students who wish to transfer from Caltech after two years, but hesitate to do so. He believes that this plan is a way of letting students

The plan would be awarded after a two-year program of science and mathematics courses, most of which are now required for graduation with a Bachelor of Science degree. The AS, then, would become a prerequisite for the BS.

It is important, says Dr. Lorden, that the degree be required for all students. It is not intended to create two levels of education at Caltech. Nor are the negative connotations that would face the BS, like Caltech. Above all, says Lorden, the plan is not to create an Associate degree. Lorden stresses that those who find that they are stuck with the degree at Caltech, it must retain the prestige of Caltech students to leave after two years with an Associate Science degree (AS), and that it would be the last step of a sequence. It is important, says Dr. Lorden, that the plan be seen as a means of providing a basic education and an upgrade to the field.

The faculty will also have a wide range of the Academic Freedom and Tenure Committee. In addition to the election of its chairman, apparently a formality, the faculty will decide on a vice-chairman, a secretary, and other officers (including members of the Faculty Board). Membership on the committee will also be decided in the balloting, which closes next Friday, May 20.

As with the faculty chairman-ship, there is only one nominee each for vice-chairman and secre-tary—Profs. David Goodstein and David Elliot (the current secretary), respectively. These two officers, with the chairman, are usually responsible for the functioning of government faculty.

The most interesting decisions will be in the election of the Facebook Board. The top six vote-getters of the fourteen nominees will be elected to three-year terms. In addition, another of these nominees will be elected to fill the remainder of Prof. Morgan's term on the Board. In case of a tie, the three nominees will be elected to fill the remainder of Prof. Morgan's term on the Board. In case of a tie, the nominating committee will decide on a vice-chairman, a secretary, and other officers (including members of the Faculty Board). Membership on the committee will also be decided in the balloting, which closes next Friday, May 20.

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Dean Morgan Nominated For Top Faculty Position

Prof. James Morgan has been chosen by the Faculty Nominat-ing Committee as the candidate for Faculty Chairman. Dr. Mor-gan is currently Associate Dean of Students and the Executive Officer; for Environmental En-gineering Science. In addition to the election of its chairman, apparently a formality, the facul-ty will decide on a vice-chairman, a secretary, and other officers (including members of the Faculty Board). Membership on the committee will also be decided in the balloting, which closes next Friday, May 20.

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Letters To The Tech

To the Editors:

You will probably be very surprised to receive this letter from a complete stranger.

I am a Korean boy who has been wanting to make a good friend in your country. I have heard so much about your country. I think your country is very beautiful, and I am eager to visit there someday.

I go to a high school. For my hobbies, I enjoy reading, painting and travelling. My age is 18. I will very happy if you introduce me to a brother or sister around my age who is one of your members so that he or she could write me.

I promise to answer any letters and to write continually. I wish to thank you for your service.

Truly yours,

Lee Changho
/Heungilsangho
168 Joonjung-dong, Dong-gu
Busan City, 601 Korea

Letter to the Tech

Korean Pen Pal

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While the risks are hypothetical . . . The benefits are real

By Dr. John M. Rosenberg

With the advent of recombinant DNA techniques, molecular biology is no longer a pure science of hypothesis and laboratory experimentation. Indeed, recombinant DNA technology can and will directly affect the lives of millions of people. Against this public concern itself with whether those effects are likely to be for good or ill, the uninstructed public policy should be made to adopt the general interest. As in most controversies where thesvolume of the debate is high, public issues are raised, there is frequently low and misconceptions abound. It is my purpose here to summarize the view that: (1) this research can be done and is being done safely; and (2) society will probably derive many practical benefits from it.

Based on a variety of techniques whereby fragments of DNA can be split apart and recombined, the so-called "recombinant" DNA molecule, can be recombined in the test tube; (3) the existence of small pieces of DNA (plasmids) that typically occur attached to a harmless bacterium when the bacterium divides. These plasmids usually contain several genes and hence add additional genetic complement to that of their host. In a typical recombinant DNA experiment, the DNA is extracted from a harmless bacterium (E. coli) and broken into fragments. Some of those fragments are then recombined into plasmids (yeast-plasmid) DNA molecules. These modified plasmids are then inserted into bacteria wherein the original plasmids are deleted. The recombinant DNA will be produced and isolated by a variety of techniques similar to that outlined above. This has been done for genes from different strains ranging from experiments to isolate individual genes from various organisms to attempt to convert bacteria into muscles for manufacturing drugs. Chances are now high that these fragments are beneficent, harmless or dangerous is not a consequence of the fact that they contain recombinant DNA, but upon what was recombined. It must also be stressed that of those tens of thousands of experiments, it is still the slightest.

It is important to note that "recombinant DNA" is a class of techniques, not an entity in itself. Up to the present, tens of thousands of strains of bacteria containing recombinant DNA have been produced and isolated by a variety of techniques similar to that outlined above. This has been done for genes from different strains ranging from experiments to isolate individual genes from various organisms to attempt to convert bacteria into muscles for manufacturing drugs. Chances are now high that these fragments are beneficent, harmless or dangerous is not a consequence of the fact that they contain recombinant DNA, but upon what was recombined. It must also be stressed that of those tens of thousands of experiments, it is still the slightest.

For example, the question at hand is probably in the process of determining whether a new strain of bacteria would be the cause of a new disease (either a human disease, or an animal that will cause a new disease or economic harm). At this point, it is important to ask the question: What characteristics must a bacterium have in order to cause disease? Simply put, two criteria must be met: the bacterium must be capable of invading or killing living tissue in the host (victim) and the possession of that capability must be a potential threat to the host. All the other safeguards that have been established to prevent any given bacterial strain from inflicting harm must be considered effective against these highly pathogenic viruses. In addition, the physical containment, the guidelines require "biological" containment when the hypothetical risks revolve around the unpredictability of "old" genes in a new environment, i.e., around our ignorance. Thus, the issue is one that we have any reason to suspect that a strain of E. coli carrying such a gene could be harmful, the issue is that we do not know for certain that it is not harmful.

This gets to the core of most of the controversy surrounding recombinant DNA. While the risks are hypothetical, the benefits are real. The benefits can be divided into two categories: (1) the discovery of specific genes; (2) the development of new diagnostic procedures. The importance of these two categories can be seen by the fact that they contain recombinant DNA, but upon what was recombined. It must also be stressed that of those tens of thousands of experiments, it is still the slightest.

Thus, the most stringent level of physical containment (termed P4) is required by the guidelines for those experiments wherein the recombinant bacteria is unlikely to occur. This consists of an elaborate system of closed chambers, filters, showers, etc. It is the same as the laboratory environment used in the P3 laboratories, but in the unlikely event it actually occurred. This consists of an elaborate system of sealed rooms, chambers, filters, showers, etc. It is the same as the laboratory environment used in the P3 laboratories, but in the unlikely event it actually occurred. This consists of an elaborate system of sealed rooms, chambers, filters, showers, etc. It is the same as the laboratory environment used in the P3 laboratories, but in the unlikely event it actually occurred.

As the level of conjectural risk diminish, so do the levels of containment. In the event that the hypothetical risk is unlikely to be serious, even if it is actually occurred, the physical containment level termed P2 is required. These containment procedures are currently in routine clinical use to deal with organisms that are "only" in dangerous as those which cause cholera, typhoid, and botulism. Indeed, the NIH guidelines stipulate in that case to use the only safeguards that have set up to protect against recombinant DNA. This has been the source of much public contention since it is widely accepted that because they exist, the dangers must be real. All the other safeguards that have been established to protect the public from these highly pathogenic viruses.

Recombinant DNA refers to the process of molecules biologists have developed to produce a particular gene segment that they are interested in studying. This is done by inserting a gene segment into a bacterium, which is replicated as the bacterium reproduces itself. Large amounts of the segment can be obtained for recombinant analysis.

To insert the gene segment, which is made from a higher organism, biologists make use of small rings of DNA in bacteria, called plasmids. A virus has a DNA strand, which is a complete circle of DNA, and bacteria can be turned into viral factories, producing DNA from the virus.

However, a vast number of possible beneficial benefits have recently been emerging from the development of recombinant DNA. For example, recombinant DNA offers the potential to produce an organism's gene, containing all the necessary information to produce a new strand of DNA, and bacteria, more of the recombinant DNA will be produced.

Recombinant DNA was originally developed as a basic research tool, but it is also being used to "map" out an organism's gene structure. However, a vast number of possible beneficial benefits have recently been emerging from the development of recombinant DNA. For example, recombinant DNA offers the potential to produce an organism's gene, containing all the necessary information to produce a new strand of DNA, and bacteria, more of the recombinant DNA will be produced.

This process can also be done by using virus instead of plasmids. A virus has a DNA strand, which is a complete circle of DNA, and bacteria can be turned into viral factories, producing DNA from the virus.

However, a vast number of possible beneficial benefits have recently been emerging from the development of recombinant DNA. For example, recombinant DNA offers the potential to produce an organism's gene, containing all the necessary information to produce a new strand of DNA, and bacteria, more of the recombinant DNA will be produced.
In the end we are ignorant of the extent of our ignorance’’

By Dr. Robert Sinheimer

The existence of the controversy is an indication of uncertainty—of a lack of knowledge ... the general principles that control ... the predictability of human actions and the limits of rationality. Or the contingency may reflect moral uncertainty concerning the virtues of differing basic values.

All of these sources of uncertainty can be seen in the controversy over recombinant DNA.

The magnitude of our uncertainty reflects the mosaic of the scientific advance that these new techniques make possible. I believe science has not taken so large a step into the unknown since Rutherford began to split atoms. The recombinants may take comfort in this analogy, for Rutherford's reactions were both explosive and disastrous. He did not, in his ignorance, ignite a consuming chain reaction in a historical sense, of course, but if we include the subsequent three decades of physics in the chain, but I would not be so determinist.

The controversy over novel microbial forms. The validity of this claim for persons on various debilitation ailments, or human infants, or other animals, in itself uncertain. It is almost certain that we will breed mortality into the Coll strains to be used in the “more dangerous” experiments. The effectiveness of such breeding, in a variety of ecological circumstances, remains to be demonstrated. Our ability to define the “more dangerous” experiments is restricted by the limitation of our knowledge. Anyone of these might fail us at any time.

We are ignorant of the depth of security of our own environmental niche. We are microcosms of one another; we don’t know one mutation away from human pathogenicity? Or two? Or three? Or one gene?

In this new domain into which we leap, we are surrounded by terra incognita. Areas of investigation are newly discovered, and their potential impact is only now, from the new perspective, to be of major importance. Will these new techniques provide meaningful ways to explore these areas. While we are nearer, confusion, is not great cause for anxiety. Further, of course, one should point out that we can now create combinations of DNAs from diverse organisms as could hardly ever, plausibly, have occurred in any natural setting.

I know that some believe we will be protected from the consequences of our ignorance by the blanket theory and workings of natural selection, which, to them, will purge the genetically lethal. They assume in effect that in each case, Nature has already achieved the highest possible level of adaptation.

I have little doubt that had they been aware of it, Rutherford and all of his ilk might have been protected by the same principle. I see no reason for such vaunted Animal Instinct. But, I believe that nature has indeed tried out all forms of adaptation that is achieves perfect equilibration. That does not mean we might not introduce deeply disturbing transients. Which leads me to the last unknown to add to the list. Simply, we are in the end, ignorant of the extent of our ignorance.

This, then, is the substratum upon which the NIH Guidelines rest. It is circumscribed by the faults of ignorance, the discontinuities and lacunae of our knowledge. Any one of these might fail us at any time:

Research upon novel self-perpetuating organisms is as different from prior science as was the first self-perpetuating cell from all prior abiotic chemistry.

There are other dimensions of hazard here. Let us refer briefly to the second class of uncertainty—human uncertainty.

Knowledge is power. As the result of the extraordinary advances in our ability to create things, we have become, without wanting it, the custodians of great and potentially terrible power. It is idle to pretend otherwise. A recital of risks and unknowns is hubris. But, the danger is real. Is it not possible that we are deluded, but faithfully real, between self-confidence and what the Greeks knew as hubris. When we are confronted with the facts, we are faced with the power of the molecule and potential of much of humanity, if not indeed our very biosphere, to not the wisdom of knowledge to keep that line in full view and respect.

Dr. Robert Sinheimer is the chairman of Caltech’s Division of Biology.
Kingfish has a new live record called from the concerts at the Roxy in March, 1975. The selected songs are all fast and furious rock and roll. Amongst them are: “Good-Bye Yer Honey”, “Jump for Joy”, “Jump Back”, and “Round and Round”. This is one band at least that hasn’t sold out and for that matter, they didn’t even sell out the Golden Bear the last time they were in town.

The album is entitled Live N’ Kickin’, which I suppose is in contrast to Dead and kickin’. That brings up some strange but understandable point about this record. His guitar and vocals are noticeably mixed down, he’s listed last in the credits for the band members, and on the back is some drivel about Bob Weir sitting in with Kingfish last year. I saw Weir play with the Fish a number of times last year and I didn’t see him sit down even once. This bit of bizarreness is due to the fact that the band is trying to make it without Weir now. They’ll be back in Los Angeles next weekend at the Whiskey to see if they succeed. Frankly, they’re just as hot without Bobby Ace, but don’t tell anyone ‘cause this reporter can do without a mob scene in Hollywood next weekend.

Halfback? May the saints be praised! Dickey Betts and Great Southern has risen out of the ashes of the Allman Brothers and brought that screaming hot Southern rock back to the people. Only Betts is a former singer for Genesis, has released a few of the latest rock and roll releases: Peter Gabriel, former lead singer for Genesis, has released his first album entitled Peter Gabriel. In it Gabriel presents an amusing collection of sounds amidst a diverse example of weird avant-garde music. Freed from the framework of Genesis, Gabriel spreads his bizarre notions about music into other less likely forms. The musical performances on the album are tight and tasteful and highlighted by Robert Fripp. The album is held together by Gabriel’s confident voice and his intriguing but elusive lyrics. This album is another sterling example for the world of the fine line which separates true genius and utter insanity.
Death Made Easy, By Woody Allen

By Greenie

It takes a Woody Allen to make a subject like death humorous. Death, presented by Spectrum Productions in its West Coast premiere, is somewhat more philosophical than the usual Woody Allen output, but it is studded with the usual nuggets of wisecracks. This play represents not only Woody Allen's answer to the philosophical problem of death, but also hints at everything from his religious views to his feelings as to his position in the universe. The main character, Kleinman, is a role tailor-made for Woody Allen, exclaims, "I have a great fear of death--it's one of my least favorite activities."

The plot is Kafkaesque: the protagonist (well-played in the Woody Allen style by Alan Solomon) is awakened in the morning by a voice accusing him of being a Killer who has been terrorizing the city. After-showing him with vague accusations and suspicions, they bully him out into the snow to play an unspecified part in a vague plan whose entirety no one appears to know. He is not told what his part is, but is ominously warned that it is his own fault that he doesn't know, that "It was your responsibility to find out" and that his lack of knowledge is suspect. He is then instructed to remain by the vague threats and by the fear that if he goes home he will be blamed for the failure of the Plan. Splitter groups appear, each with their own plans, which supplant the original, and fighting develops among the groups.

In the end, of course, Kleinman meets the Killer, and is capriciously murdered.

It is fairly easy to attach metaphysical meanings to the undefined Plan, and to speculate as to their relevance to Woody Allen's own beliefs ("Things may seem chaotic, Kleinman," says a greatly intense vigilante, "but they're not.")

Alan Solomon's portrayal of Kleinman as a sane man desperately clinging to reality in the face of an absurd universe would receive a nod from the author; Raymond Roy as the Cop and Dan Driggins as the Maniac also deserve special note. Spectrum has certainly well-cast the play, and if Director Shirley Marneus is not Woody Allen, she has managed to infuse the play with a nightmarishly inexorable quality which keeps the audience riveted.

Living Room is a one-act homily by Caltech's professor Oscar Mandel. Dr. Mandel wields a sage finger of rebuke at irony tower intellectually, playing upon the idealism inherent in liberal philosophy, and reminding us that the fact that he is oppressed by the majority does not prevent the unfortunate from turning on those weaker than themselves.

Since Living Room is intended only as a proverb, a moral story, the characters are storybook people, yet they are stylized rather than wooden; prototypes rather than stereotypes. Dr. Mandel uses this stylization in intentional contrast to real people with real identities as in the end when Nanny is suddenly recognized as a human being for the first time by Mr. Available-a commentary on the intellectual's inability to see humanity as people.

Dr. Mandel tells his proverb in a comfortably familiar, once-upon-a-time avuncular tone of voice, reminiscent of afternoons spent at the knee of some wise, aged relative. While this tone is at times tinged with paternalism, the play leaves the audience with a pleasant feeling of having been edited and instructed.

Special note should be made of the performances of King Stuart as an almost grotesquely effete Mathew Available, and Maxine Elliott's complementing sturdily maternal Nanny.

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Caltech Relay Team Qualifies For District Finals

By Tommy Trolljan

The Conference Prelims last Friday and Saturday featured some unexpected surprises for some, and an ingratiatingly enjoyable end of the season for others.

One of the major breakthroughs came when the 440yd relay team of Norm Murray, Greg Blaendell, John Hattick and Brian Saulo (see freshmen and three sophomores) ran a 44.0. Their performance made them the only element of Caltech's track team to break District III prelims (being held today) on their own merits. Caltech's relay team, third by virtue of a host of disqualifications, managed a 4:40.6.

There were several other efforts that deserve mentioning. Rob Bourret, taking off on the third lap, ran a 4:11.1500-meters (equivalent to a sub-4:30 mile) to take sixth. Norm Murray came close to doubling his own right, running a 22.6 in the 200-meter finals. John Hattick somehow made it through the prelims and into the finals with two all-time bests of 53.7 in the prelims and 53.0 in the 400. And the finals saw another tremendous promise as he is a soph with few races behind him. Duane Boman continued along in the 400 intermediate hurdles, running a 59.2. Steve Kellogg, in his last collegiate race of such a110bly short distance, ran the 5000 in 15:23.

With the victory, Norm Murray in the 200, John Hattick in the 400, Duane Boman in the 400 intermediates, Tom McCabe in the 800, Rob Bourret in the 1500, Brett Van Steenwyk in the 400, Duane Boman in the 800, Brett Van Steenwyk in the 400, Duane Boman continued along in the 400, and Steve Kellogg, in the 5000, Steve Kellogg's in the 10,000, and our 440 relay team in district, all of which, except the 10,000 (held Saturday) will be held today at the University of Redlands.

Golf Season Finally Over

By Rock Howard

The Caltech golf season folded to a close as team members participated in a Southern California Intercollegiate match at San Diego and the SCIAC conference championships. No one (not even SCIAC) was well enough to reveal their scores to me. It is doubtful that anyone was within 20 strokes of the 36-hole total of 149 which won the conference championship (for Peter Graves of Pomona.

In retrospect, the highlight of the Tech golf season was a match loss to LaVerne by the close margin of 31-23. Charlie Curato, Nelson Goldkinner, Curt Meister, and Robert Chou scored points for Tech in the match.

The golf team struggled along this year not only because of the usual lack of talent and/or time for the players, but also because of a lack of communication among the team members. There were several othe...