Hepatitis Vaccine Possible

Caltech News Bureau

A low-cost vaccine to combat one of the world's major diseases, hepatitis B, may result from the discovery that a minor viral protein produces a powerful immune reaction to the disease in humans. The protein already offers a novel method of diagnosing the disease.

Researchers at New York Blood Center and Caltech have reported discovery and synthesis of the protein in an article in the April 27 issue of Science. The scientists are Dr. A. Robert Neurath and Nathan Strick of the Blood Center's Lindsley F. Kimball Research Institute and Dr. B. H. Kent of Caltech's Division of Biology. Their paper is entitled "Location and Chemical Synthesis of a Pre-S Gene Coded Immuno­dominant Epitope of Hepatitis B Virus."

The scientists concentrated their efforts on the major coat protein of the hepatitis B virus. In the past, hepatitis B antibodies found in humans after infection have been used to determine the presence of the virus in an individual. Until now, P36 and P33 have been largely ignored by researchers because they make up only a small percentage of the protein coat.

However, when the researchers used protein analysis techniques to isolate the hepatitis B coat proteins, they found that P33 and P36 reacted especially strongly with hepatitis B antibodies found in humans after infection. Other minor coat protein portions of P33 and P36—approximately 5 percent of both proteins—were responsible for this reaction, so the researchers concentrated their attention on this portion to analyze further.

The amino acid structure of P33 and P36 was identical to proteins identified by other scientists in the 1984 American Physical Society Biological Physics Prize for outstanding achievement in biological physics research. In selecting Berg, the award committee cited him for "his elucidation of complex bacterial phenomena, in particular chemotaxis (motion toward or away from chemicals) and bacterial locomotion, through simple but penetrating physical theories and brilliant experiments." The prize also includes an honorarium.

Berg was born in 1927 in Berlin and moved to the United States in 1933. He received his bachelor's degree in physics at Harvard in 1948 and his PhD in physics from Cambridge University in 1953. He joined the Caltech faculty in 1959 and has been a professor of physics and molecular biology since 1973.

Berg's research has focused on bacterial behavior, particularly locomotion, digestion and is widely used in genetic engineering. The tracking microscope has been used in research on recombinant DNA. The tracking microscope has revealed that E. coli have an extremely high speed, and Dr. Berg has been a leader in studies of bacterial locomotion.

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Dr. Berg's current studies are bringing to light many additional complexities in the behavior of organisms on the lower rungs of the evolutionary ladder. Recently, he has been observing an unusual bacteria called Escherichia coli, a common intestinal bacterium that assists digestion and is widely used in work on recombinant DNA. The tracking microscope has revealed that E. coli are rudimentary cousins who move vigorously toward chemical reactants that provoke their interest.

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The Inside World

Blacker: There will be no entry for Blacker House this week. — The Communist Party

Dahney: No entry.

Fleming: Last weekend was the surprisingly successful Fleming-Page Outdoor Olympiad. The Seniors jumped out to an early lead by winning volleyball, and clinched the championship hours later by winning football. With apparently no motivation for the raft race (using the likes of J. Sahr and S. Stevens) the Seniors left Kup behind and cruised into last place in the rafting competition. By setting a new world record, the Juniors captured second overall as they won the raft race comfortably. The final results were:

<table>
<thead>
<tr>
<th>Team</th>
<th>Volleyball</th>
<th>Football</th>
<th>Rafting</th>
<th>Total</th>
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<tr>
<td>Seniors</td>
<td>1st</td>
<td>1st</td>
<td>3rd</td>
<td>9 pts.</td>
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<tr>
<td>Juniors</td>
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<td>Sophomores</td>
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In interhouse basketball, Fleming dropped into a tie for 1st after a couple of games with cockamps Page and Blacker.

This coming weekend is a surprise party... and it's such a surprise that nobody knows where it's going to be. Keep you eyes and ears open.

This Sunday pain shall be inflicted upon the scrumballs.

Page: Frosh dusted the Sophs 26-7 last week. Sorry Robbie!

The Olympiad with Fleming this week was a great success. The seniors got lucky and came in first, followed by the Juniors, Frosh, then Sophs. Oh, well!

Warren is severe!

Thanks Lloyd, for a great party.

Look forward to egg coloring sometime this week. Bring your own eggs!

Easter egg hunt Sunday noon at Corona and brunch at three at the house.

Sheets have gone up. Counterstacks are in progress. The seniors are wimps.

Rickets: No entry.

Ruddock: Well, Laserium was last weekend - we had a good turnout. Sam fell asleep, but we all know he's too uncultured to appreciate Pink Floyd.

Meanwhile, many of us were in Sacramento attending the Model UN. No, really, we did go to meetings. Honest. The Subcommitee as Hot Tub Usage had frequent sessions. I would like to thank Aaron Roodman for the good job he did keeping everything cool.

Ricketts: No entry.

Lloyd: The party was a blast. The Source played well into the night.

Thanks, Donkey. I would also like to thank Gleeen for keeping an unnamed Elinor in the van while we were driving at 40 mph.

Anyway, this weekend we're having a "Which Way to the Beach?" party Saturday night in Spalding Penthouse. Appropriate attire is of course required. It promises to be a great party, so everyone come out and have a good time!

Alley 3 beat Alley 2 in Milikan Elevator Racing.

As the Lizard King would say, take it as it comes.

The Caltech Y Fly-by

Friday ... April 20

Noon concert - Toni Malone, Gospel Music on Good Friday.

Sign Up today or Monday for "Sentenced to Life" - a play about unwanted people. Presented at Sierra Madre Congregational Church on Wednesday evening. Transportation will be provided.

Monday ... April 23

Sign Up for the Philharmonic Friday night, April 27, at 8:30. Last of the season!

Wednesday ... April 25


Bring a lunch and a friend.

Thursday ... April 26

Sports Day. You, too, can help organize Sports Day. 10 a.m. at the MOSH's office.

Friday ... April 27

Noon concert - Another surprise from our own Suzy Blue!!

Don't forget, Sports Day is May 4!

Lost something? Come look in our lost and found. For more information on any program, call the Caltech Y office at 356-6163, or just drop in.

Tech-Oxy-Caltech; Ath Formal

By-Dan Schwartz

Plans are moving right along for our giant Caltech-Oxy-Claremont blowout next Saturday. If you'd like to help out, talk to a Social Team member in your house after we have the ESC meeting this Monday.

Make sure to sign up for the Ath Formal now. The signs come down next week. By the way, we'll be having Filet-in-Chemise, an entree with Filet Mignon wrapped in a soft crepe. The cost will be $19 per person. If you have a group of 3, 4, 5, or 6 couples that would like to sit together, drop me a note or stop by 134 Page. Such tables may also choose an alternate to the house wine from the Ath wine list.

Questions or comments? Call the Social Hotline, x6274.

The California Tech

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For more information about this document, call 356-6163, or just drop in.
Doubleheader: Last Saturday night was a party night for Caltech with Blacker's I·Publicans in the Blacker-Ricketts party (above) and The Source sponsored by Lloyd at Winnett Student Center (below). Photos by Min Su Yun

Notes

Appointed Offices Filled
Following are the new holders of ASCIT appointed offices:
- Totem Editor Chwe
- Big T Editor A. Ghosh, G. Crawford
- Little T Editor Sahnow
- Big T Business Manager Peterson
- California Tech Business Managers Adams, Peterson
- ASCIT Executive Committee Gainey, A. Ghosh, Goldstein, Mapes, Premont, J. Watanabe, F. Wong
- Social Activities Committee G. Gibbs, L. Henderson
- President's Staff Asthana, G. Crawford, Curtin, A. Ghosh, Mihos, Murch, Sauter
- Elections Chairman Evans
- Educational Policies Committee Choy, Pitt, Takemoto
- Communications Director Lodge
- Student Darkroom Chairman Mapes
- Publications Darkroom Chairman Yun.

Buy Caltech Cards and save 20%

CALTECH'S
BURGER CONTINENTAL
will offer you a deal you can not refuse.
good food at reasonable prices refills on soft drinks at all times seconds on salad bar

SPECIALTIES: SHISH—KABOB, SHAORMA, SOUVLAXI—STEAK
HOMEMADE PASTRIES: BAKLAVA, BURMA, AND NAPOLEONS

For the Entire Month Of April
A Free Root Beer Float to All Freshmen and Sophomores

Faculty, Grad Students, Attend!
Mondays and Tuesdays are Beer Days. Half price on beer.

Buy Caltech Cards and save 20%
Reduce Fat Intake

The aim is to reduce total fat intake to 30 percent of daily calories. Fats can be divided between saturated, monounsaturated, and polyunsaturated fats. In addition, cholesterol intake should not exceed 300 milligrams a day, averaged over a week.

A common way to recognize the dietary fats and to distinguish between the 3 fats is to look for whether they are semi-solid at room temperature (meats, dairy products, and some vegetable products), mono-unsaturated fats are liquid at room temperature, become thicker as they are refrigerated, and are solid at room temperature and when refrigerated (plant sources).

Fats have been linked to many health problems including obesity, cancer and arteriosclerosis. Nevertheless, fats are essential in the diet to maintain good health. Fat is important for energy storage and release, protection of vital organs, insulation and as a carrier and solvent for four vitamins (A, D, E, and K).

Fats are also responsible for depressing hunger pangs associated with eating. Fats in the diet stimulate the release of a hormone which produces the feeling of fullness after eating. This is essential for the reduction of food intake when dealing with a weight control or weight reduction program.

We observe significant changes in the past years in how much fat and cholesterol we eat. We now eat much less saturated fats, less cholesterol, and more polyunsaturated fats than a century ago. We are moving in the right direction but we are hardly home free.

Fats and cholesterol are still far too prominent in our diets and implicated in several diseases that are taking many lives. Following these recommendations would help to decrease your intake of dietary fat and cholesterol in your diet:

1. Choose lean cuts of meat:
   - Beef—flank, round, tenderloin, sirloin tip steak, extra lean ground beef.
   - Pork—center cut ham, boiled sliced ham, loin chop and pork tenderloin.
   - Veal—all cuts except breasts.
   - Lamb—leg of lamb, leg chop, lamb steak, sirloin chop.
   - Poultry—small chickens, turkey and cornish game hen; small birds are leaner than large ones, while white meat is lower in cholesterol than dark meat. Fish—most are low in fats.


3. Switch to low-fat or skim milk and milk products.
   - Become aware of what is truly low in fat. Buttermilk is low fat and low fat is not always the same. Yogurt should be 99% fat-free to be considered low-fat. Ice milk and soft salt contain less than half the fat of ice cream; sherbet is even lower. Avoid cream substitutions, usually made with saturated fat and sugars. Be careful with all cheeses, even the part-skim milk ones, imitations are deceiving.

4. Limit egg yolks to 2-4 a week, including those in prepared and processed foods. For every 2 eggs, discard 1 yolk. You can eat as many egg whites as you want, an excellent source of low-cal protein.

5. When you are using fats and oils, use vegetable oils rather than animal fats or solid vegetable shortenings. The total fat and calorie content are the same but the saturated fat content is much lower and there is now cholesterol in pure vegetable fats.

6. Watch out for the goodies—eat them in moderation.

Protein for Hep B

From page 1
diagnostic test for hepatitis B, they said, and may more effectively identify the infective form of the disease.

"The animal antibodies reacted with the intact virus and related viruses to such an extent that we have been able to use them to detect virus in human tissues," said Drs. Neurath and Kent. "This means it might be possible to distinguish between the 3 fats and overwhelmed with nutritional information attacking fats. Fats have been linked to too many health problems including obesity, cancer and arteriosclerosis. Nevertheless, fats are essential in the diet to maintain good health. Fat is important for energy storage and release, protection of vital organs, insulation and as a carrier and solvent for four vitamins (A, D, E, K, and K).

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Berg’s Prize

from page 1
Cytophaga that appears to glide over surfaces by a chemical synthesis of viral proteins—pioneered by Richard Lerner of the Scripps Clinic and others—for the manufacture of vaccines,” said Drs. Neurath and Kent. “These synthetic peptides have a number of applications that may be used to reduce the number of deaths caused by viral diseases.”

The scientists’ research was supported by the National Heart, Lung, and Blood Institute, the New York Blood Center, and by Caltech.

The Body Shop

The aim is to reduce total fat intake to 30 percent of daily calories. Fats can be divided between saturated, monounsaturated, and polyunsaturated fats. In addition, cholesterol intake should not exceed 300 milligrams a day, averaged over a week.

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from page 1
Cytophaga that appears to glide over surfaces by a means strongly resembling tractor treads, and a fungus, Phycomyces, which uses a chemical radar system to detect barriers.

The author of numerous studies on bacterial motion and behavior, Dr. Berg also serves on the editorial board of the journals Cell Motility and Modern Cell Biology. He is a member of the American Physical Society, Biophysical Society, American Society for Microbiology, American Society for Biological Chemists, American Association for the Advancement of Science, and the New York Academy of Science. In 1978-79, he was the recipient of a Science Faculty Professional Development Award, from the National Science Foundation. His work with bacteria was featured in a 1977 episode of the BBC series Horizons, and repeated in 1980 on a NOVA program entitled “Living Machines.”

Dr. K. the “team,” is giving a shooting lesson in a recent interhouse basketball game between Lloyd and Page.

The Outside World

A Libyan Embassy gunman killed a police officer and wounded 10 people with machine gun fire on Monday in London. The shooting took place during an anti-Qaddafi demonstration in front of the Libyan Embassy. British police immediately surrounded the embassy but could not enter by force without violating the diplomatic immunity protection given to the embassy and its personnel. In retaliation, Libyan troops and demonstrators in Tripoli surrounded the British Embassy, but ceased their siege one day later. The British government is seeking a diplomatic solution to the standoff with Libya.

The United States and other NATO members offered a new troop-reducing plan to the Warsaw Pact on Wednesday. The troop reduction plan would cover combat and support forces, and would cut each side’s forces to 900,000 men, of which up to 700,000 can be ground personnel. There are disagreements between the Warsaw Pact and NATO over how many men each side actually has deployed, and such differences must first be resolved.

John DeLorean’s trial opened Thursday on charges of drug trafficking. He is accused of trying to raise money for his company, DeLorean Motor Company, in a $24 million cocaine deal. Federal agents have a videotape of him dealing cocaine, but defense attorneys say that he was entrapped by the government.

Pat Harrison gives a cannonball treatment to an Oxy player who was attempting to steal second base.

Photo by Min Su Yun
Sports Day Nears

by Stewart A. Peebles

Sports Day is coming! Remember last year when you got to go and take your day, May 4. That's the date of Sports Day! When you were in softball or in soccer? Remember last year when you played in volleyball, swimming, and a triathlon. The events will be held during the afternoon in the gym and on the fields and courts around it. Schedules and sign-up sheets are posted in the student houses. Sign up for any sports you plan to participate in so that the organizers can prepare the activities more effectively. The sports will be arranged so you can sign up by any time during the scheduled period and get a chance to play. There will be a competition at the Olive Walk at 5:30, after the events have been completed. There will be a dinner, as well as contests and door prizes. It's a good chance to meet and get to know members at the Caltech community that you don't get to see often, so sign up and plan to participate.

Weekly Sports Calendar

| Sat. 4-21 | 11:00 am | Track | UCSD & Westmont |
| Sat. 4-21 | 11:00 am | Women's Tennis | JPL |
| Sat. 4-21 | 12 noon | Baseball | Claremont-Mudd |
| Sat. 4-21 | 3:30 pm | Men's Tennis | Faculty |
| Mon 4-23 | 1:00 pm | Golf | Redlands |
| Tue 4-24 | 3:00 pm | Baseball | Claremont-Mudd |
| Tue 4-24 | 3:00 pm | Men's Tennis | Azusa Pacific |
| Wed 4-25 | All Day | Women's Tennis | SCIAC Tournament |
| Wed 4-25 | All Day | Women's Tennis | Occidental |
| Fri 4-27 | All Day | Track | Caltech |
| Fri 4-27 | 2:00 pm | Track | Caltech |
| Fri 4-27 | 2:00 pm | Women's Tennis | SCIAC Tournament |
| Fri 4-27 | 2:00 pm | Track | Occidental |
| Fri 4-27 | 2:00 pm | Men's Tennis | Redlands |
| Fri 4-27 | All Day | Women's Tennis | SCIAC Tournament |
| Sat 4-28 | 11:00 am | Track | Caltech |
| Sat 4-28 | 12 noon | Women's Soccer | La Salle (H) |
| Sun 4-29 | 3:00 pm | Women's Soccer | Shakers |

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Water Polo Women Win

by Skip's Cousin

Toss-up question: "Is there a river in Riverside?"

Badilla, Caltech: "Yes.

Bonus question: "For what reasons is there a river there?"

Hildeman, Caltech: "Eleven months of the year it is used as a skate park and a bus driver training ground.

"Correct. That gives Caltech a total of 115 points and the victory over U.C. Riverside in the SCIAC Series of College Bowl." (Wild screams in the background.)

Ah, yes. How can one describe Riverside? Pleasantly nestled at the end of the San Gabriel Valley. A city amongst the cow chips, where the sky is a glistening brown and the temperature disgustingly hot. Surely this is a place where waterpolo thrives. Where the men are men, and the women are rougher than the Amazons, though not as fast. What a beautiful morning April 14th was.

The Caltech women's water-polo team had undergone some management and organization during the preceding week. SCIAC rules, as interpreted by the Athletic Director, were explained to the retirement of coach Clint Dodd. He was replaced by his assistant who is William W. Winger, a former Boogiehard acting as goalkeeper coach. This way our coach confirms Dodd could not be blamed for using his far more experienced and skilled women players to teach a select few men secret plays. The U.C. Riverside pool rivals only the LaBrea Tar Pits in the number of dead carp swimming in one spot. Of course, it is only bugs and not mastodons there, but it took a concerted amount of warming-up time to learn when not to take the watch. Watkins and Private Petiazaki were there to teach ladies, with Dodd helping out on the outside points.

The game was close from the coin toss. The Beavers looked somewhat sluggish, and if not for the excellent play of goalie Charlotte "The Rock" Clark, Caltech would have been well behind after three quarters. As it was, the score was 1-0.

With only one substitute, the fourth quarter did not look to be in Caltech's favor. But Doc's gang came out smoking, getting four goals to Riverside's one, and causing a third ejection on one of the opposition's top players. The Riverside, losing two of their starting players, went back into a tie at 7-all. With seconds ticking down, Boom Boom Blumacked powered in the winner for the good guys. The victory saved 8-7 without a single raindrop.

Official statistics for the game are as follows: 11 goals, 2 ejections, and 6 bug bites; Bonnie-3 goals, 1 ejection, and no car problems; Lynn-1 goal, 2 ejections, and a gorgeous smile; Ute-2 ejections and no Whittier party; and Gloria—1 good game plus a dozen great brownies (even with the ants).

Drought Hits Beavers

by Doug Oute

Now is the time of the season that all Beaver baseball fans have come to call "the drought." The drought usually hits each year when the Beavers begin their league season, and lasts until the end of the year. Despite their best efforts, the Beavers have once again fallen on hard times.

The Beavers went into their series against Pomona Pitzer two weeks ago with the sweet taste of victory still lingering in their memory. Three games later, the Beavers emerged, and the annual drought was on. The Beavers went 0-3 against Pomona Pitzer, losing 10-0 and 16-4.

It's hard to win any game when you don't score any runs, and the Beavers didn't in the Beavers' last three games. There were only six hits, two of which were by Pat Harrison. In the fourth game, the Beavers had only eight hits, but did a better job of putting them together. Pat Harrison, Michael Keating, and Jim Kimbrick each had two hits for the Beavers. Unfortunately, the Beavers were unable to collect quite a few hits of their own to keep the game out of reach.

On Tuesday, the Beavers traveled to Oxy to do battle once again. Caltech suffered their fifth loss in a row against the Beavers, suffering a 13-5 drubbing in the game. It was a hard fought battle and Caltech was able to put up some points, but ultimately was outmatched by their opponents. The Beavers' victory put them in a position to make a run for the SCIAC title.

Three Tie for First in Basketball

by All Man at Large

Barbara, any more upssets, this year's Interhouse Basketball Season will end with a three-way tie among Caltech, Blacker, and Page. Each of the three had a 1-1 record against the other two.

Blacker blew out Page, behind Se Jung Shin's 20 points and Steve Hawes' 17, 55-37. Fleming and Blacker 64-44 in a game that was close for three quarters. Ed Zanelli led Fleming with 25 points, while Stewart Peebles (16) and Brian Connor (17) put up a strong effort. Page came back to beat Fleming 53-45, pushed on by 14 points from Rob Holden, 13 from Tom Heer, and 12 from Fred Ferrante. Ed Zanelli carried Fleming with 25 points, keeping Fleming in the game for Stewart Peebles fould out. The scoring stars of the season that all Beaver baseball fans have come to call "the drought." The drought usually hits each year when the Beavers begin their league season, and lasts until the end of the year. Despite their best efforts, the Beavers have once again fallen on hard times.

Cricketers Beat Camarillo

by Brian Warr

A quickly scheduled return match against our old foe, Camarillo, proved a much closer match than the first.

Caltech, once again invited against bat, lost a couple of early wickets due to the ball not coming on, but were then steered towards a great total by the control and skill of Santosho (31) and Rakesh (28). The key to their partnership of 52 was their ability to find gaps for singles and twos, waiting patiently for bad balls to hit for four.

The middle order also held up well, with Nadeem (9), San Jay (9) and Rick (10 not out), Caltech at last showing some length in the batting. The score after their allotted 30 overs was 106-7, a highly creditable performance on what was a very slow outfield.

For once it was Caltech's fielding and bowling which showed weaknesses. Runs came freely from both opening bowlers, forcing Caltech early positions, Zeta is Caltech's best on the defensive. In such a

About Cricket

by Chris Meidl

So what is this cricket game anyway? Cricket is played much like baseball, except that the batsman and bowler (pitcher) are in the center of the field. The bowlers dropped all three tests (sticks) upon which two balls (small pieces of wood) are placed. The bowlers then try to knock the balls off the sticks.

In the process of guarding the wickets, the batsman hits the ball and scores runs by running from his wicket to the one facing him about 20 yards away. Another bowler at the opposite wicket does the same. If the balls get knocked off one set of wickets while the bowler is out of the crease (a small rectangle around each wicket), the bowler is caught and is replaced by a new player.An over is six balls and there are 11 players on a team.

Oh yes! ... the game breaks at four in the afternoon for tea!
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Letter

A Minority View

Uncertainty About Quantum Physics?

Dear Editor:

Previous editors of The California Tech have published two letters of mine that questioned the experimental validity of relativity theory. They considered those letters important enough for their readers to see. I hope you still print minority views.

Basic to quantum theory is the idea that particles and waves can interfere with each other. You can see this by yourself in your career, but I think you confuse it with something else. Only waves are known to act this way.

In the best double-slit experiments a laser is weakened to emit photons one at a time. Yet, over a few months' time, its photons can still build up an interference pattern on a photographic plate. This means that wave interference occurs at the quantum level, i.e. to single photons. At first glance quantum theory looks right, even though most of its early contributors were skeptical of it.

Since electrons also can "behave as waves," model physicists believe, for historical reasons, that particles are waves. But have they kept us from learning otherwise in school, by their replacement of all double slits with diffraction gratings? Well, turning a cliché around, it's awfully hard to see the trees for the forest when you are looking at 10,000 to 100,000 slits per inch. That is no way to separate the particles from the waves! Let me tell you what I did.

For an incomplete high school project in 1963, I used opaque screen to block various parts of the light in a double slit interference pattern. This experiment was repeated ten years later to reexamine the dark minimum between two blocked maxima. I then discovered that my "canceled" light never entered the minimum; rather it was all diverted to the adjacent maxima. I checked this finding by tracing the paths of light with a cloud of chalk dust and a small white card.

Everyone agrees that you can see where all the photons go. Quantum theorists, in particular, have intensity measurements to show that no light is lost during interference. However, they still doubt the existence of my traceable paths (meaning the electromagnetic deflections in flight, which leave gaps like those in Saturn's rings). So, it is hard for me to compete with the text-book notion that light can be recovered beyond its "temporary cancellation" in space. Maybe I should dare those of you who believe whatever you've been taught in school to recover the photons that you think are cancelled between two blocked maxima. This can't be done, because they don't go there. For the same reason, blocking a minimum won't dim the maxima beyond it. So much for the wave theory of light! But then what defines the photon?

In most experiments with double-slit interference, the distance between the two slits is greater than the "wavelength of the particles" in question. A laser can thus be used to emit single photons alternately at each slit or at just one slit. The two slits are usually spaced far enough apart that nothing, not even Heisenberg's uncertainty principle, keeps us from choosing the slits where all our photons go.

Even though each photon is now aimed to go through only one slit, both slits must still be open to it for an interference pattern to form. This means that field waves surrounding any given photon are what pass through both slits, interfere with themselves, and deflect the photon after we send it through either slit. In short, particles are separated from the waves! Otherwise, anyone who wants to maintain the concept of "waves" or "particles" with "force-carrying particles" will have to find some of the latter passing through both slits to deflect a photon.

There are other historical and experimental reasons for the above result. Newton once postulated the existence of aether (field) waves that seemed to guide his corpuscles of light. De Broglie had the same thought, but he was unable to explain interference with it in terms of wave mechanics. Bonner, on the other hand, supports my own idea that photons are neutral trains of neutrons on the quantum level.

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Here are two observations as a mere probability, quantum theory pays lip service to the Huygens-Fresnel wave fronts. Therefore, before I give this principle a new physical interpretation, I will doubt that diffraction is predetermined at the quantum level.

The sun's gravitational field is significant. In its treatment of diffraction, as a mere probability, quantum theory pays lip service to the Huygens-Fresnel wave fronts. Therefore, before I give this principle a new physical interpretation, I will doubt that diffraction is predetermined at the quantum level.

Here are two observations of apparently gravitational waves that run counter to the static "space-curvature" model of general relativity: Figure 1 pictures a wave-diffraction pattern that was built up from data on the sun's gravitational field.
Quantum Mechanics Improbable?

From page 6

Deflection of starlight. There is a similar, though much smaller, lunar effect called "shadow bands," which occur just before and just after total solar eclipses.

Until I classified them as diffraction patterns, these observations lacked a sensible explanation. Most astronomers ignored the data collected after 1919 on solar deflections of starlight, because many of those values disagree with general relativity. They also presumed that shadow bands occur when mountains and craters on the Moon's edge reflect the last rays of (or the first rays after) totally eclipsed sunlight. However, such edge reflections can produce only irregular patterns outside the shadow. Do modern astronomers have less respect for observational facts than for mathematical theories? Well, I am unable to convince them that diffraction, like classical deflection, occurs everywhere. Take your pick: knife edge, ball, Moon, or Sun. They will all cause diffraction.

Although lunar shadow bands pass by much too quickly for us to examine, the solar deflections of starlight mentioned above easily disprove quantum theory's acasuality. Using background stars as faint point sources of light, we can readily tell from photographs that the photons are diffraacted as a function of how close each one passes by the Sun. No star image was spread out. But if diffraction is predetermined at the quantum level, what happens to our quantum uncertainties? Of course! There are still plenty of limitations on how accurately we can aim photons in small-scale laboratory experiments.
**Staff Meeting**
The Tech staff meets 12:15 p.m. on Mondays in Room 127 Baxter. All are encouraged to attend.

**Benefit Concert**
The Caltech Jam Room presents a benefit concert to raise money. Six Caltech bands will be playing in Dabney Gardens on April 21. The concert will start at 1:30 p.m. and go on until late in the evening. A $2.00 donation is requested.

**Women and Professions**
The OWC will sponsor events during Secretaries Awareness Week, honoring Caltech's secretaries. On Tuesday, April 24, Gerda Steele, Program Manager from the Commission on the Status of Women, will speak on the topic of "Changing Professions." The talk will be aimed at women in the secretarial profession and will include an extensive question and answer period. It will be held in Winnett Lounge at noon.

On Wednesday, April 25, Evelyn Johnson of the Nine to Five organization will speak at noon. The talk will be outdoors by the Winnett Center and will be about "Today's Secretary." Also on Wednesday, a table will be open outdoors of Winnett with special surprises for support staff members, and information pertaining to the profession of secretary as well as everything you always wanted to know about the OWC. The table will be open from 9:30 a.m. to 3:00 p.m., so come out and see what we have to offer!

We need women to tend the table, so if you could donate an hour or even a half hour of your time between 9:30 and 3:00 on Wednesday, April 25, it would be greatly appreciated. Call Mickey Gray on X4167 to set up a time.

**Free Food**
You can help update the little t restaurant section. If you have been to any local restaurants that weren't reviewed in last year's little t or wish to update a review that did appear - you can win a free dinner.

The Master's Office is offering five prizes of $20 towards dinner for two at an as-yet-unreviewed restaurant. To qualify for one of the prizes, simply send a short review to little t, (107-51) containing the following information:
- restaurant name and address (with directions if necessary) and whether it is within walking distance
- approximate price range
- comments on atmosphere, service, and the quality of the food
- an overall rating between one and four stars

Each week, one review will be drawn at random from all of those received, and the reviewer will be given $20 toward eating at and reviewing a new restaurant (payable when the review is received). Only the first three reviews of any given restaurant will be put into the drawing, and only significant changes to previous reviews will be accepted. The prizes are open to undergrads only, but submissions are welcome from everyone.

Enter as often as you wish, and see next week's Tech for the first winner.

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