

Bay Area Skeptics Information Sheet

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Editor: Kent Harker

[In March of this year, a civil trial in Hollister addressed questions of medical quackery and religious freedom in the case of a "Reverend" Andrews and his prescribed health regime. First, we have an article covering the background of this case by attorney Pressman, followed by an interview with an expert witness for the prosecution. -- Assoc. Ed.]

INSTITUTE CLOSSES AFTER INJUNCTION

by David Pressman

One of the more outre health regimes, for which miraculous cures have been claimed, has been the practice of fasting, either on juices or on water alone. Although many gurus in the health movement recommend and conduct fasts for therapeutic purposes, conventional medicine dismisses virtually all fasting, except for obesity, as worthless and dangerous. However, no scientific tests of therapeutic fasting have been made, so that, except for recognizing the dangers of medically unsupervised fasting and other extreme diets, the scientific literature is sorely deficient in this area and the medical community's opinion seems premature.

One of the most extreme practitioners of fasting recently closed down after the State of California moved against him for practicing medicine without a license. The story of his ruin is most interesting.

Arthur D. Andrews, Jr., 65, the self-styled first minister of "The Religious School of Natural Hygiene", a health institute in Hollister with religious overtones, was sued in late 1985 in the Superior Court for San Benito County by the California Board of Medical Quality Assurance. The BMQA sought an injunction to force Andrews and his 12-bed institute to cease his fasting treatment.

The BMQA brought suit after several former patients of Andrews (he called them students) complained of injuries and the Board learned that six people had died as a result of extended fasts under Andrews's supervision. The water fasts were undertaken for as long as 8 weeks, plus as many more weeks to recover; prices ranging from \$225 to \$300 per week to cure various ailments, ranging from arthritis to ulcerative colitis were charged.

Andrews opened his "school" in 1979 and advertised it on radio, in various health magazines (including his own), and by lectures in the Bay Area. He advocated a "natural hygiene" health regime, which

involved the usual measures (exercise, sunlight, fresh air, low stress, etc.) with several notable additions: the diet was mostly raw foods; vitamins, drugs, and medical treatments were excluded (except for emergencies), and extended fasts on distilled water only were prescribed in cases of disease. Andrews claimed that virtually all disease occurred because of the accumulation of toxins in the body and that during a fast with rest, a person's body shut down its normal activities (such as digestion), leaving it with enough free energy to do a thorough house-cleaning so that it could rid itself of the toxins. Each issue of his magazine featured a lengthy testimonial, written by Andrews, about a patient who was cured of one or more diseases by fasting and a natural hygiene diet. His facility was a converted farmhouse on a large walnut grove, just north of Hollister.

Natural hygiene is a health movement that was started by Sylvester Graham, a minister and the inventor of the graham cracker, in the 1800s. Graham's natural hygiene largely died out, but was revived in the early 1930s by a naturopath named Dr. Herbert M. Shelton, author of many books including the popular "Fasting Can Save Your Life". Natural hygiene recently gained nation-wide notoriety with the publication of a best-seller on natural hygiene, "Fit for Life", by the Diamonds. About 10 other natural hygiene institutes exist in the US and other countries; all of these are run by medically-trained people, such as chiropractors, MDs, or DOs, and they claim to have a high success rate, often in cases where conventional medicine has failed. Andrews' was the only one with religious overtones, and, because of the religion and Andrews' lack of any medical license, the American Natural Hygiene Association, based in Tampa, FL, considered him a pariah.

Andrews has also been civilly sued by four former patients. Two of the suits are still pending and two were settled out of court. Also, the state is considering bringing criminal charges against him for two of the six deaths that occurred as a result of the fasts at his institute. (In 1970, Andrews was convicted of statutory rape for having sex with inmates of a county facility for delinquent girls that he was managing. He served six months in the county jail, and was then released on probation.) In addition, the San Benito County Welfare Department has charged that Andrews bilked an elderly client out of \$60,000 and accused him of treating two minors with fasts, but no charges have been filed in these cases.

At the trial, three former patients testified against Andrews, stating that Andrews claimed long fasts (at \$225 to \$300 per week) would cure their medical problems; that while on their fasts he gave them medical examinations, and that as a result of severe overfasting they suffered permanent physical, neurological, and psychological damage, including a phobia, strabismus, incontinence, chronic muscular pain, and non-ambulation. Also, several medical experts, including BAS board member Wallace Sampson, MD, a professor of medicine at Stanford, testified that fasting has no therapeutic merit; that by giving examinations and making contracts

to supervise fasts, Andrew was in fact practicing medicine, and that it is dangerous to fast without medical tests and supervision, and that one faster, Sara Roundtree, died as a result of the accumulation of excess hydrogen ions in her bloodstream brought about by autolysis (self-digestion) of bodily proteins.

Andrews defended the suit on the basis of religious freedom and on the grounds that he wasn't practicing medicine and that the injuries that occurred were not his fault. Several former patients also testified for Andrews, stating that they fasted for religious, not therapeutic purposes, that their fasts cured them of various ailments, and that Andrews didn't do any true medical testing -- he used the stethoscope and the sphygmomanometer only to reassure and comfort them. Also several Hollywood ministers testified that fasting has been a religious practice since ancient times. His attorney's brief included, in addition to the usual legal citations, numerous biblical citations, such as Luke 2:37. Andrews further garnered about 500 supporting declarations and \$25,000 for trial expenses from followers who supported his practices, including director Peter Bogdanovich and his actress-sister Anna. His followers packed the courtroom during the trial and stated that the state's action infringed their religious freedom. The media widely covered and reported the trial; it was featured in newspapers and TV stations as far as Sacramento.

The trial lasted about one week, although it was conducted in segments for a period of over a month. Immediately at the end of Andrew's defense, the judge granted the state's requested injunction, finding that Andrews did in fact practice medicine by counseling fasting, supervising fasts, and conducting physical examinations. The injunction forbade Andrews to supervise fasts or to conduct medical tests. Also Andrews was ordered to pay the state \$6,000 for court and investigation costs; Andrews is appealing this monetary judgement. Despite the injunction, Andrews had intended to continue conducting fasts for "spiritual purposes". Under the injunction, he could have done this, functioning as a religious retreat, but the publicity evidently got to his landlord, who successfully sued to evict Andrews from the farmhouse. Andrews was last reported again selling cookware, together with used furniture, in the small Santa Cruz mountain town of Boulder Creek.

[The following interview with BAS Advisor Wallace I. Sampson, M.D., was conducted for "BASIS" by Mark Hodes. Dr. Sampson is a Clinical Associate Professor of Medicine at Stanford University and testified as an expert witness for the prosecution at the trial of Arthur Andrews.

Hodes: What constitutes the practice of medicine?

Sampson: There is a difference between the legal definition and what physicians define the practice of medicine to be.

H: If someone is licensed to practice medicine, what is he licensed

to do?

S: Diagnose and treat conditions of disease. The law lists a number of procedures. At Andrews's trial, the prosecution asked me that question, and when I started to quote the law, the opposing attorney objected. The judge sustained the objection. Apparently, and expert witness is not supposed to state what is in the law, only his opinion. So I just went ahead and said what my opinion was, and it became the standard of the court, because I was an expert witness for the state.

H: Do you have to be compensated in order to practice medicine?

S: That is implied. The law doesn't so state, but that is one of my criteria.

H: So, if a parent applies a cold compress to his child's head, he is not practicing medicine without a license?

S: Yes, but there is a limit to that. You can't make an incision in somebody, even for free. That is a violation of the law, unless it is done under some emergency circumstance. The definition of the practice of medicine is very broad under the law, but there are numerous exceptions. Exceptions are made for dentists, nurses, chiropractors, psychologists, and podiatrists. These all have their own law defining their fields of practice.

The Brown administration Board of Medical Quality tried without success to redefine the practice of medicine by limiting it to inserting an instrument into any orifice, incision of the skin or any part of the body with a scalpel, and radiation therapy. Anything else would not be the practice of medicine.

H: Even diagnosis?

S: Right. Anybody could diagnose and give advice. Anybody could prescribe non-dangerous drugs (whatever those would be), and could diagnose a condition and treat it, except in those particular ways proscribed. This definition was far too narrow. The medical profession objected and the proposal didn't get through the legislature. The definition really is in flux, and there are a lot of fuzzy boundaries.

H: What was Reverend Andrews doing that fell under the definition of practicing medicine?

S: That is what we had to define in the court, because I don't think it had been adequately defined before. The point of the prosecuting attorney was that in the State of California, Andrews was practicing medicine by my definition. My sense of practice was that once Andrews counsels someone in a fast or starvation past 24 hours and monitors the person, all of those actions constitute the practice of medicine. We didn't have to establish that each one separately constituted the practice of medicine, but that

collectively they did.

Andrews took pulse, blood pressure, temperature, activity status, took a history, did all of those things almost every day, and made notes on a chart. He supervised the starvation by telling the person that he thought the person was ready to eat, not to eat, etc. And in so doing, Andrews was actually interposing himself as a biological advisor, you might say, in a very serious condition. That also, I thought, was the practice of medicine. Those two were the major points: Andrews monitored and advised, and he kept records, just as a doctor would.

H: Of course, to support the charge of practicing medicine without a license, it isn't necessary to show the defendant to be practicing badly, only to be practicing. Is Andrews to be charged now with manslaughter?

S: That is my understanding. I have had no contact with the district attorney since the civil trial.

H: If a physician had done exactly the things that Andrews did, the chances are, I suppose, that charges of manslaughter might never be brought.

S: They might not, but they might. This was far outside of the standard practice. I was asked that by the judge because the defense attorney did not want to bring it up. I replied that any physician who did this should be disciplined by the Board.

H: What about the religious defense?

S: That was the main contention of the defense: that this was a religious matter, not a medical matter. And that is what we spent two or three days trying to disprove by establishing that a fast is a medical condition. I took the position that a fast of any duration beyond 24 hours results in certain physiological changes that automatically make it a potentially dangerous situation, and that anyone assuming care or providing advice in respect to such a fast would in essence be practicing medicine on someone in a diseased state. I didn't use the word "disease". It was just a state of such physiological change that it was endangering the person's life.

H: What physiological changes occur?

S: There are a number. At about 24 hours, the body begins to burn protein as well as carbohydrates and fats. When you start to lose protein, you lose not just muscle, but enzymes and nerve tissue, a lot of tissue that is vital for functioning. Although you may not see changes that are immediately apparent, you can measure biological changes.

H: Fasts are practiced by persons of many religious backgrounds. Are their religious counselors guilty of practicing medicine

without a license?

S: At the trial, I was asked: "Suppose, Doctor, that a rabbi tells a person to fast for 24 hours on Yom Kippur. Does that constitute the practice of medicine?" I answered that it is traditional to fast on Yom Kippur, and that the rabbi doesn't order people to do anything. The fasting is a personal, religious matter and is not a matter of a transaction between those two people. I said that is true of all religious fasting. A person may fast for religious reasons, but my point was that if a person does it on his own, then there is no legal problem. The person may be declared temporarily insane if he puts his life in danger, just as in a suicide attempt. There are no real health reasons for undertaking such an extended fast. The problem in the trial was whether Andrews was monitoring a medical condition. The court bought our argument that he was.

H: Can your interpretation of what constitutes medical practice be used as a precedent under the law?

S: Only if there were an unsuccessful appeal by the defendant to a higher court. I think we would win an appeal, because the case is quite clear. There were two deaths and two or three cases of nerve damage that were substantiated by medical specialists. Andrews clearly did not know what he was doing. He didn't even give vitamins to prevent vitamin deficiency during these fasts, and his victims didn't have enough good sense to take them. Andrews promoted the illusion of competency by recording notes as if he were a doctor. Reading these things was like reading a medical chart, except, of course, they didn't make as much sense.

H: The outcome of the trial was that the judge issued an order enjoining Andrews from practicing medicine, but not from fasting. It seemed a strange resolution to the case.

S: Apparently, Andrews's followers are allowed to do what they are doing as long as Andrews doesn't practice medicine. What he was doing was the practice of medicine, so he is in the position of trying to figure out what the court order means. I would assume he would be in compliance if he doesn't tell people when to start and stop, if he doesn't take blood pressures and pulses, etc. If he just rents them a room, a place to fast, then his followers would have the responsibility of starving themselves to death.

NEWTON'S OUT AND WRIGHT'S RIGHT

by Shawn Carlson

[Mr. Walter C. Wright, Jr., a 69-year-old "folk scientist" stirred up a fuss about his revolutionary theory he alleged was being suppressed by the scientific community. His letters to prominent scientists, NASA, and major research institutes were largely ignored, so Wright turned to several congressmen; these efforts finally reached the office of the Department of Education. SHAWN

CARLSON, a Ph.D. candidate in physics at U.C. Berkeley and BAS Board member, was then asked to make an investigation.

Shawn is published in prestigious journals for his searching analyses of astrology claims, and has already established himself as a thorough researcher and investigator. The material here presented is a summary of his paper submitted to the Department of Education. The full text of Shawn's report is obtainable by writing to him at Bldg. 50, Rm. 348, Lawrence Berkeley Labs, Berkeley, CA 94720. (Note at 10/12/89: Shawn is no longer at LBL, but can be reached through Bay Area Skeptics). Thanks to Shawn for the great work, and for sharing it with "BASIS" readers. -- Ed.]

Mr. Wright's odyssey began in 1968 when his then-12-year-old son stated he did not believe Newton's theory of gravity, in part because if the moon pulls the oceans (tidal action), it should pull the water from the earth and carry it all the way to the moon. Since this didn't happen, Newton must be wrong. Mr. Wright agreed with his son, and together with him and another son he "sat down to probe the heavens with our knowledge of electronics, believing the universe was made up of atoms, which is the basis of electron theory." Although Wright obviously had little formal training, he advanced his ideas as "Push Gravity Theory". He established a museum described as "the only space-action universe museum ever built in the world", and began a crusade to overthrow Newton via news media and public lectures; he asks people to write their representatives and sign petitions. He demands that his theory be taught in the public schools as an alternative to Newton's theory.

I corresponded with Mr. Wright to inform him of my visit under the auspices of the Dept. of Education, and received a packet of information about his theory and the museum. Wright's letterhead features a picture of Einstein with a caption "ALBERT EINSTEIN, RELATIVITY -- 1905". On the other side was his own picture with the explanation, "WALTER C. WRIGHT, PUSH GRAVITY -- 1968". Wright claims to have written over 3,000 papers and that "everything you will see [in his museum] is new in physics".

According to Wright, gravity is a "push"; the consequence of the electromagnetic energy radiating from the sun pushing objects away. Further, the strength of gravitational repulsion depends on the chemistry of the body. For example, Pluto is the furthest planet because its chemical composition is such that the sun pushes harder on it than on any other planet. His theory explains why stars in two interpenetrating galaxies do not collide, how the big bang happened, and why the moons of Jupiter are cratered as they are, etc.

Wright asserts gravity CANNOT be attraction, because everything in the universe would be "stuck together like a bunch of grapes, and Halley's comet would crash into the sun rather than orbiting."

Apart from being able to quote Newton's three laws of motion, Wright has no demonstrable understanding of even the basic laws of

mechanics; he does not understand the principle of conservation of angular momentum, which clearly explains why comets do not crash into the sun. Wright's model used a ferrous nut as the comet and a magnet glued to a cardboard surface as the sun -- the nut could never be made to circle the magnet. My attempt to explain the presence of frictional forces between the cardboard and the nut, thus invalidating his model, was considered irrelevant.

One of his "new physics" demonstrations consisted of standing a heavy iron bolt on end, and then rapidly moving a very powerful horseshoe magnet toward it. Claiming the result was unexpected, he challenged me to predict what would happen to the bolt. (Most non-physicists would probably expect the bolt to be picked up by the magnet.) Much to Wright's surprise, I predicted that the bolt would fall over, which it did. He refused to deal with the fact that I was able to predict the outcome without his new physics, but recounted instances in which others guessed wrong.

Other -- rather simple -- miracle properties Wright alleges: "Magnets produce twists and circles. Heat produces magnetism. Gravity depends upon chemistry." For the first claim, I showed the effect is well known, and described by equations with which he was unfamiliar. In the other two cases, he failed to produce any evidence or experiment to demonstrate his claim. None of this daunted him in the least.

Wright's mathematics is from simple to non-existent. His equations bear striking resemblance to accepted theory when they are reasonably accurate, but they have little meaning in reality otherwise, with arbitrary constants and manufactured terminology. When he reminded me that particles of the solar wind are deflected from the earth (the push) rather than falling into the earth as Newton's theory would require, my explanation that those particles are charged and therefore deflected by interaction with the earth's magnetic field failed to move him. In short, no counter argument was even conceivable.

He is confused about many facts. He believes that Einstein supported his idea that gravity is a push. "Einstein said that gravity comes at us from outer space, pushing us down to the earth." He is confusing the idea of a stationary gravitational field with Einstein's prediction of gravity waves. Wright confuses electromagnetic radiation with the solar wind, believing that photons have magnetic moments, and that the sun is anti-matter, and that faster-than-light travel is possible.

In my opinion, Wright's convictions are unshakable. Despite being given counter argument after counter argument regarding his ideas, despite being informed about errors in his logic and basic facts, despite clear demonstrations that his "new effects" in physics are easily anticipated using well-established physics, Mr. Wright did not perceptibly back down one inch from any of his convictions.

ANOTHER CAUSE FOR UFO SIGHTINGS

by H. Keith Henson

Most UFO sightings have origins in natural phenomena, or misidentification of man-made lights, such as the Woodbridge case reported in the Fall '86 "Skeptical Inquirer". But there are cases that are the result of deception. I know, because I was involved in three of them, and have personal knowledge of one more. Of the four cases, only one was ever exposed.

My earliest experience was in 1959, when a group of my high-school friends and I hung a fluorescent light on thin wires over a street in Prescott, Arizona, and made it flicker with a Model T spark coil. We would turn it on at night when a car was only a hundred feet away, so the driver was hard put to see what it was before the car had passed under it. People would stop, back up, look again and again, and never figure out what they had seen, while we were up on someone's porch trying to keep from bursting with laughter.

It worked so well that we moved our activities to a highway outside of town. If our victims had their radios on, all the better, because close proximity to a spark coil makes a radio sound like crushing a mountain of cornflakes with a bulldozer. The number of locals who encountered our UFOs was at least in the dozens. Prescott's reputation as a UFO center may have some of its origins in our pranks.

In 1960, I started engineering studies at the University of Arizona. A number of my friends from Prescott were also going to school there, and by next year, we had founded the Druid Student Center just north of the campus. The origin of "The Druids" and the story of the "Bandersnatch", an off-campus humor newspaper we published in the mid-to-late '60s are a story in themselves.

Our UFO constructions, which peaked in 1962, were a relatively minor part of our activities, though they brought us a great deal of publicity.

It took a long time to learn to build a really good UFO. We had been launching hydrogen-filled plastic dry-cleaning bags in Prescott since 1957. My old aluminum-and-lye hydrogen generator may still be in the basement of my parents' house. When we moved to Tucson, we found a place that sold us an unperforated, 2,000-foot roll of dry-cleaning plastic tubing. We discovered that while natural gas had only half the lift of helium, it had enough, and was available at the turn of a valve. We launched several long tubes in the daytime with rolls of toilet paper that made long streamers when a fuse released the paper.

We lifted several radar corners with these balloons, but never got any feedback that anyone noticed them, so we quit. We also launched a number of sections of tubing with fuses and small packets of gunpowder to set them on fire. One of these (about 100 feet long)

got picked up by the news media when a large number of people reported it as a crashed plane. The Air Force "explanation" of "neon lights reflecting off low clouds" certainly didn't satisfy anyone who saw huge flames leaping in the sky. We did this only a few times because we never really felt good about dropping flaming plastic over the city, though it most likely went out before hitting the ground.

The first one in the UFO series (all launched at night) we sent up with a battery and bulb. Knowing what we were looking at, we were able to track it in a car far across the city. But a flashlight bulb looks like a star from any distance away, and it wasn't easy to track. Next variation was a candle. The first one went out when it was launched. We then tried putting the candle near the bottom of a six-foot-long bag of clear plastic closed on the bottom to stop the draft. It worked OK, but we had the same problem we did with the bulb; it looked like a star.

Next we made up five-to-six-foot-long bags of light-colored crepe paper to diffuse the light. That made the light much more visible. Our most common version used eight one-inch candle stubs sitting on tin-can lids that were soldered to a stiff, four-foot wire. The straight wire was centered with thread in a ring of small, stiff wire that had a crepe paper bag folded over and stapled to it. The bags were made of two sheets of paper by folding three edges over twice and stapling, then turning the bag inside-out.

We used a generous 10 feet of strong thread to hang these lanterns under two 40-foot pieces of plastic tubing. (No point in getting lighted candles too near all that gas!)

They worked great. Our UFOs were visible for miles. The air flow in Tucson during the summer was usually toward the mountains, and they would fade out after about 10-15 minutes.

Not all of them were a success. One got rained on and came down about 15 blocks away, but we managed to recover that one without getting caught, though a small dog had hysterics when it came down in his yard. (Dr. MacDonald of UFO fame saw that one and said it had come down somewhere between where he was and some mountains 20 miles away.) We got to where we almost felt obliged to send one up at least twice a week, because so many people in the city were looking for them.

We got caught trying to outdo ourselves. We built a two-lantern version and used three pieces of tubing that we tied in a triangle to lift it. This one really caused a stir, because it looked like a red UFO and a green one playing tag in the sky as it went up in a spiral. However, at the last minute, a light wind came up -- our UFO was sure to tangle in the power wires if we launched it from the back yard -- so we walked the whole works across a major street and let it go from a parking lot at the University of Arizona. Some high-school kids saw us, and couldn't resist the chance to solve the big mystery. They talked to the local reporters, and, the next

day, both the local reporters and Dr. MacDonald were beating on our door.

I was temporarily out of school at the time, working as an engineer for a local TV station, when the story broke. There was an excitable middle-aged woman who did an early local news program at the station, who came bursting into the control area wanting to know why I didn't tell her as soon as the story broke so she could interview me on the news (which she proceeded to do). We wondered if we would get into trouble, but no one in a legal capacity ever said a thing about it. We put up a weak story about tracking local nighttime winds.

While we were causing all the stories, the Tucson papers treated it straight. They reported that moving lights in the sky had been seen by a number of witnesses, but didn't take it any further. Dr. MacDonald treated it straight, too, and was only about an hour behind the reporter.

Years later, I found out that a second cousin of mine had been launching similar UFOs over Albuquerque about the same time.

The significant point is that of four different incidents, we jokers were only caught once. Had we been a little more cautious or gotten tired of causing the fuss, we never would have been caught.

For me, the story has always been a handy way to deal with a UFO believer. When they ask me if I believe in UFOs, I say, "Of course. I used to build them."

EDITOR'S CORNER

Logic. Formal symbolic logic. What does it have to do with helping us discover the "truth"? The notions of parapsychology or pseudoscience in general often fail under the hot light of logic when it is turned on and focused.

We use the terms "reason", "conclude", etc., so loosely in everyday conversation that when we employ them in a more formal sense, they are diluted by familiarity. That's one of the reasons it is necessary to clarify one's thinking when trying to reach some conclusion with the force of logical implication.

The singular beauty of formal logic, in my opinion, is its power to analyze a group of statements devoid of their content. To learn that logic has little to do with content often comes as a surprise to those who have not had formal training. Logic is concerned with form.

We are wont to think that there is something natural about formal reasoning, and this is a mistake; the familiar expression is

"common sense". Well, isn't logic common sense? In fact, no. Our common sense can be very misleading. (This same judgement error is made by those who believe that science is a field of knowledge in which anyone with a little common sense can find his or her way around just fine.)

As an epistemological tool, I believe logic is without equal. It requires only nominal study, and it can be practiced with nothing more than a normally adept (not out-of-body) brain (a pencil and paper would be nice, too). It is based on a few, simple axioms for which one is hard-pressed to deny the truth (even though some do). The Law of Contradiction, which asserts that a statement and its negation cannot be simultaneously true is one of the axioms, written symbolically: "(P and $\sim$ P) is false", where " $\sim$ " means "not". For example, the statement "This pen is all black and it is not all black" is clearly false. Notice that it makes no difference what the statement P stands for -- in that FORM it is an expression of the Law of Contradiction. This makes life easier, because statements are often filled with so much emotional baggage that one may be unable to see elements of the reasoning. Logic is cold and hard precisely because statements may be put in that symbolic form. The statement "God exists" can be dispassionately studied if we assign Q in its place.

Scientific creationists violate the Law of Contradiction with their assertion that the universe must deteriorate by the 2nd Law of Thermodynamics, and the universe is not deteriorating because it is God's perfect creation. The familiar expression of the Law of Contradiction is you can't have your cake and eat it.

The power of logic is multiplied in various ways; for example, there are many equivalent forms of a given statement, and each may present a different perspective to a question under consideration. One such parallel form is the so-called "contrapositive". Perhaps the raison d'etre of formal logic is the "implication" -- a statement in the form $P \Rightarrow Q$, read variously "If P is true, then Q is true", or "P implies Q", or "Q follows from P". Q is called the consequent of the premise P. This is formal reasoning: establish statement P, argue carefully and conclude Q.

Now, the contrapositive of this statement is obtained by negating BOTH P and Q, and then switching their positions, i.e. $P \Rightarrow Q$ is the same as $\sim Q \Rightarrow \sim P$. It is like a mirror, reflecting the statement from the other direction. Because it is analogous, the truth value of the contrapositive is identical to that of the original.

Of all the errors in logic, misuse (intentional or from ignorance) and misunderstanding of the contrapositive are perhaps some of the most common, so there is something to be gained in understanding its proper application. The most likely error comes in confusing the contrapositive and the converse of a statement $P \Rightarrow Q$. The converse is $Q \Rightarrow P$, and it is NOT logically equivalent.

Here's an example of how easily we are misled by confusing the

contrapositive and the converse of a statement: Let $P = \text{"You study your logic lessons well"}$ and $Q = \text{"You will receive an A on the exam"}$, and now combine them into an implication, "If you study your logic lessons well, then you will receive an A on the exam", which is of the form $P \Rightarrow Q$.

Suppose I meet you a few days later and you tell me you received an A on your paper. What may I conclude? Our common sense has probably misled us, for the majority will say, "Why, of course, you studied diligently." We have, if we erred in this way, treated the converse as equivalent to the contrapositive.

In the above example, you may have an ill-gotten A by cheating. Or you may have just been lucky -- the implication only guarantees what will happen if you study hard. Because the converse is so seductive, I believe many propositions are presented in such a way as to invite the reader/hearer to make the converse error. Since a thesis presented in this manner has not explicitly tripped the inquirer, it is all the more insidious, because when the inquirer makes his/her own (false) conclusion, he/she is much more apt to hang on to it. Now look at the contrapositive of the statement: If you did NOT receive an A, you did not study hard. This is equivalent to the original, and the restatement in this form may increase our understanding of the statement so we are less likely to fall prey to the incorrect converse trap: If you receive an A, you studied hard. If the statements are put in symbolic form, we are not at all inclined to accept the converse as necessarily valid.

So much for the ABCs of logic. Now, like most rational, objective things, it has its limitations. Logic cannot tell us if something is true. It can only tell us if an argument is valid, and validity and truth are not synonymous. The argument "If the moon is made of green cheese, then I'm a monkey's uncle" may be valid, but I cannot establish the absolute truth or falsity of my lineage by the argument. The truth of a conclusion stands or falls on the truth of the premise, if the argument is correct. But logic is not really concerned with those truth values; its only regard is the validity of the argument. Therefore, one may not make the unwarranted conclusion that because an argument is false, the conclusion is false.

For example, a demonstration that the "Five Ways of Aquinas" for proving the existence of God are all of them riddled with error does not mean that God does not exist -- only that His existence has not been established by the (il)logical presentation. Even if an argument is found to be accurate in every point, the truth or falsity of the conclusion is not forced until we know the truth or falsity of the premise.

So, if one is about finding the truth (not validity) of a conclusion, logic shows us that the linchpin of a sequence of valid arguments is the premise. Airtight reasoning does not preclude falsity in our conclusion -- in fact, if the premise is false and

the reasoning ironclad, the falsity of the conclusion is GUARANTEED. [Note at 10/12/89: This statement is incorrect. See October 1987 "BASIS" for the correction.]

If an argument is rigorous from beginning to end, we can place the same degree of certainty on the conclusion as we are able to determine about the premise; and if the string is found to be vitiated by the least flaw, one has not advanced any further than arrant nonsense, no matter how sophisticated the appearance of the statements. There are not really degrees of error -- error is measured qualitatively, not quantitatively. In other words, many propositions fail long before they need be tested by empirical methods.

Now for the final exam. Let's check the validity of a cherished notion in parapsychology: "If there are statistical perturbations in a parapsychology experiment, psi is occurring." (Hint: look at the contrapositive, and note how the converse is tempting you.) Send in your papers for grading. (For new subscribers who may not be familiar with the term "psi", it is a catch-all used by parapsychologists to cover all psychic phenomena.) There are at least three logic flaws in the statement. Can you find them?

RAMPARTS

[Ramparts is a regular feature of "BASIS", and your participation is urged. Clip, snip and tear bits of irrationality from your local scene and send them to the EDITOR. If you want to add some comment with the submission, please do so.]

A reader sent an article from "Welcome to Planet Earth" a new age magazine for sensitives. The piece from the mag that caught our reader's eye is allegedly about things Mayan and some cosmic event that is to begin August 16. I read the article several times, and cannot come up with anything but question marks, but I'm not a sensitive. It was part of an interview with Dr. Jose Arguelles, a Ph.D. art historian from the U. of Chicago. [Note from 10/12/89: The "cosmic event" was the much-ballyhooed "Harmonic Convergence", which Arguelles invented in such passages as the one quoted below.]

Since I can't make head or tails about what is happening, I give you a couple of paragraphs from Dr. Arguelles's book, with a few of my own cogent analyses in parentheses; put on your hip boots, the bowl shift is pretty deep.

"The Mayan Great Circle is actually the description of a galactic beam (%^) measuring 5200 tun, or 5125 earth years in diameter (@#!). The earth entered such a beam on August 13, 3113 B.C., and will leave it in the year 2012 A.D. The charged Beam [sic] is to accelerate the evolving DNA ('+%&,) into a technology-extruding organism (~^#!*) that creates in effect a planetary exo-nervous system (&^* and |@#@). When the exo-nervous system is in place

acceleration becomes exponential (of course &@!%) and phases into synchronization. (What about #*@ and ~?)"

This gaseous nonsense goes on for another 267 pages, and ONE paragraph is enough to get the idea. I urge all U. of C. grads to burn their alumni cards.

Arguelles's nonsense has thankfully come under the scathing pen and brush of none other than Garry Trudeau in his "Doonesbury" strip. The sensitives promise that the world will come to an end but for their collective consciousness-raising on Sunday the 16th. "BASIS" will be in your hands after this event, and I predict that Arguelles and company will have saved us.

BAS board member ANDREW FRAKNOI, Executive Officer of the Astronomical Society of the Pacific and former "S.F. Chronicle" columnist wrote to the editor of said paper about a lengthy piece they did on "Return of the UFO People". The one-sided article was "balanced" by a tiny box that mentioned the \$11,000 BAS award with Don Henvick's name and the BAS hotline number.

Andy points out that "This one-sided coverage is particularly ironic in view of the fact that the `Chronicle' boasts two of the best science reporters in the country."

Fraknoi continues, "I know that it is fashionable among editors and reporters to dismiss the damage such stories can do by repeating the claim that no readers take such stories seriously, but, let me assure you, as someone who teaches both students and teachers, that today such a belief is no longer in touch with reality. Barraged by media coverage of pseudoscience, youngsters these days have very little skill in making skeptical judgements in these areas."

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ERICH THE GREAT

The incredible claims of Erich von Daniken ("Chariots of the Gods?") will be examined in some detail for the September meeting by James Wheeler.

Jim has personally toured many of the sites von Daniken wrote about, including the Easter Islands (the enormous head monoliths). He has analyzed von Daniken's claims against the facts in those locales, and has some interesting comparisons with a special emphasis on the Easter Island monoliths for which he has completed some original research.

Von Daniken's preposterous notions sold an enormous number of books in the '60s; he was largely unchallenged in print until some time later, and, as usual, the facts did not sell very well. After the initial ado, subsequent books by Erich did mediocre to poor.

Come listen to this presentation. Maybe you'll see how far we have come?

Opinions expressed in "BASIS" are those of the authors and do not necessarily reflect those of BAS, its board or its advisors.

The above are selected articles from the September, 1987 issue of "BASIS", the monthly publication of Bay Area Skeptics. You can obtain a free sample copy by sending your name and address to BAY AREA SKEPTICS, 4030 Moraga, San Francisco, CA 94122-3928 or by leaving a message on "The Skeptic's Board" BBS (415-648-8944) or on the 415-LA-TRUTH (voice) hotline.

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