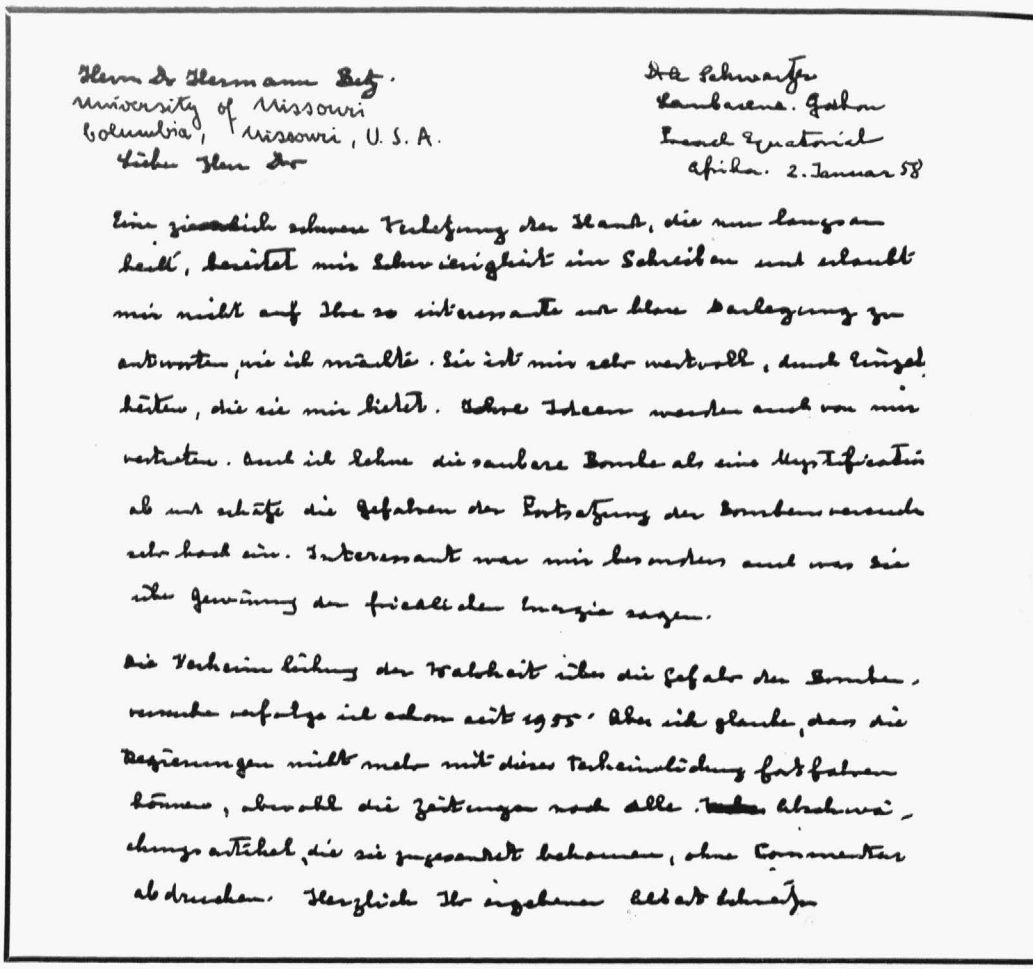

Herrn Dr Hermann Betz
University of Missouri
Columbia, Missouri, U.S.A.

Dr A Schweitzer
Lambarene. Gabun
French Equatorial
Afrika. 2. Januar 58

Liebe Herr Dr

Eine ziemlich schwere Verletzung der Hand, die nun lange an heilt, bereitet mir Schwierigkeit im Schreiben und erlaubt mir nicht auf Ihre so interessante und klare Darlegung so antworten, wie ich möchte. Sie ist mir sehr wertvoll, durch Einzelheiten, die sie mir bietet. Ihre Ideen werden auch von mir vertreten. Auch ich lehne die saubere Bombe als eine Mystifikation ab und schätze die Gefahren der Entsetzung der Bombenversuche sehr hoch ein. Interessant war mir besonders auch was Sie über Gewinnung der friedlichen Energie sagen.

Die Verheimlichung der Wahrheit über die Gefahr der Bombenversuche verfolge ich schon seit 1955. Aber ich glaube, dass die Regierungen nicht mehr mit dieser Verheimlichung Erfolg haben können, obwohl die Zeitungen noch alle [illegible] Abschwächungsartikel, die sie zugesandt bekommen, ohne Commentar abdrucken. Herzlich Ihr ergebener Albert Schweitzer

atomic radiation . . .

With the exception of fire, atomic radiation probably represents the greatest single discovery in the history of civilization.

In its larger aspects, the field of atomic radiation, or what is the same thing, atomic energy, involves, among other things, questions of physics, chemistry, technology, biology, genetics, medicine, meteorology, oceanography, agriculture, forestry, food distribution, law, economics, finance, war, ethics and religion. In short, it affects in greater or lesser degree practically every phase of human existence.

Obviously no one man can claim to speak authoritatively in even a single one of those sub-fields, let alone the whole of them. A few examples will make this point clear.

Nuclear reactions, which are the basis of all atomic phenomena, are studied by physicists and chemists. Making such reactions possible on a large scale is the job of technology. Biologists, geneticists and medical men must determine the short- and long-range effects of man-made radiation on human health and heredity. Meteorologists and oceanographers have to find out how radio-active particles are distributed all over the earth by the currents in the upper atmosphere and in the oceans. We need also to know how radiation affects our fields, forests and water supplies, what it does to food-crops, to cattle and fish and to all other plants and animals. Then there is the question of legal liability for large-scale damage resulting from inevitable atomic accidents. Who will pay claims running into the hundreds of millions? What effect will the gigantic expenditures we are now committed to have on our economic stability? Can atomic war be avoided, or will it wipe out the human race?

Have we any legal or moral right to rain a steady shower of violent poison down upon millions of people all over the earth without their consent? Or should we paraphrase the slogan of our forefathers to read: "No radiation without representation!"?

A leading Japanese geneticist declared recently that if the present rate of testing is continued, the Japanese people will be extinct in ten generations. Japanese scientists are very good, but even if this one were quite wrong, we still have no right whatever to use as guinea pigs people whom we desperately need as our friends.

And finally, we profess to be a Christian nation.

Dr. Albert Schweitzer
Lambarene, Gabon, French Equatorial Africa
January 2nd 58

Dr. Herman Betz
University of Missouri
Columbia, Missouri

Dear Dr. Betz,

A rather bad injury to my hand, healing very slowly, makes it difficult for me to write, and to answer your interesting and clear statement which is very valuable to me by the details it gives. I stand for the same ideas as you do. I, too, refuse to accept the Clean Bomb; the name is merely a mystification. I, too, consider the risk of the continuation of the bomb tests to be a terribly great one. What you say about the development of peace-time use is of special interest to me.

Already since 1955 I am watching the secrecy thrown on the truth about the danger of the bomb tests. But I think that now governments no longer will be able to continue this policy of secrecy, although papers still accept and print, without comment, all articles depreciating the risk whenever these are sent to them.

Sincerely yours
Albert Schweitzer

Dr. Schweitzer also sent autographed picture.

what it means to us

By Herman Betz

Is what we are doing reconcilable with any decent religious principles? We would not dream of lining thousands of people against a wall and shooting them down in order to test a new machine-gun. Yet this, in effect, is what the United States, Russia and Great Britain do when they test their fantastic new weapons. To be sure, we see no bodies slump over in death, we hear no anguished cries. These victims die silently. We do not know who they are or where they are, but they are victims just the same, and the iniquity cannot be glossed over by any number of fine words, or loose talk about negligibility.

To go into these matters with any degree of completeness would take hours, so I can at best only summarize the most urgent questions.

One reason why any exposition of these matters, in the particular case of atomic energy, has until recently been difficult, is that all public discussions of atomic questions are impeded by the veil of secrecy which from the beginning all governments have thrown over them.

Now there never were any real atomic secrets.

Once Otto Hahn, the German physicist had succeeded, in 1939, in splitting the uranium atom, it was only a question of time, money and brains when every industrially developed nation would do the same and proceed to build atomic bombs and reactors. Our scientists have always realized that England, France, Germany and Russia have just as good scientists as any we have. What we could do, they could do. And they did. Now that the Russians have launched a number of earth-satellites we shall have to revise our ideas about American scientific supremacy, though there is no occasion to go to the opposite extreme and believe that we are now completely outclassed. The truth is simply that the Russians have always been particularly interested in rockets, have done much of the fundamental research on them, and have been willing to divert unlimited scientific and material resources from their civilian economy in order to achieve this breakthrough. We could unquestionably have done the same, if we had been willing to pay the same price. Of course, our national pride is hurt, but I am not at all sure that we ought to have paid that price, because I believe that in the end it would buy us nothing. In any case, it will not be long before Red China will have H-bombs and atomic reactors. The same is true of

Dr. Herman Betz, professor of mathematics at the University of Missouri, has been waging a one-man campaign against nuclear weapons testing since June, 1957. He made his first talk on atomic radiation at that time and has since given fourteen additional talks, many of them before state groups on the campus. Proud of a letter from Dr. Albert Schweitzer (reproduced and translated on the preceding pages), he explains: "My correspondence with Dr. Schweitzer came about in this way: Dr. Willard H. Libby, the scientific member of the A.E.C., last year wrote an open letter to Dr. Schweitzer attacking him for his statement regarding nuclear testing which the Nobel Prize Committee had made public. Since the views I had expressed concerning weapons-testing coincided with those of Dr. Schweitzer, and since the American press seemed to be almost wholly on Libby's side, I wanted Dr. Schweitzer to know that many thinking Americans agree with him that the testing of nuclear weapons must be brought to an end, lest irreparable damage be done to generations yet unborn. So I sent him a copy of one of my addresses on atomic radiation, and his letter followed almost immediately. Later he sent an autographed photo of himself as well as pictures of the hospital buildings and grounds at Lambarene." In recent months Dr. Schweitzer has released three additional statements through the Nobel Committee. Dr. Betz, before coming to the M.U. faculty in 1924, taught at Yale, where he received his Ph.D., and at Cornell and the University of Michigan. He is a native of Rochester, N. Y. and a graduate of the University of Rochester.

India and other Asiatic countries. The idea that a handful of spies were responsible for Russia's acquiring the atomic bomb and guided missiles is simply nonsense. Of course, all governments have always employed espionage, but it is yet to be proved that any of them ever obtained a really decisive advantage over the others in this way.

Needless to say, no one is suggesting that we advertise our latest scientific and technological achievements to the whole world, least of all Russia.

Scientific progress in the various countries is never strictly synchronous. First one will be temporarily ahead, then another, and even a temporary advantage may act as an effective restraint against rash action, or precipitate such action, depending upon who has the advantage.

In other words, prudence and common sense are always called for. But when, as was reported recently, some overzealous Pentagon censor stamps as "classified and restricted" a book on the Civil War, written 78 years ago by a Civil War general, he shows neither prudence nor common sense.

What is happening now is that instead of seriously hampering our enemies, we are keeping our own citizens in the dark about things they ought to know. The Russians, of course, represent the very acme of the secrecy-mania. With them, everything is kept secret. Communism, as a system of government, has proved to be a colossal and dismal failure. Nevertheless, it would be very foolish of us to underestimate the very great power and capabilities of the Russians.

In our own case, it has to be emphasized that we have not been fully informed—under either administration—for the past 12 years, about the essential facts related to nuclear energy.

Maybe part of this is justified on grounds of military security. But it can also not be denied that much of it has nothing to do with security. What little the government has released virtually had to be pried out of it, usually after some unforeseen disaster had occurred, as in the case of the Japanese fishermen. On the other hand, the government has put out, and continues to put out, misleading, conflicting and sometimes downright false pronouncements, all of which are calculated to reassure the American people that everything is under control and there is no need to worry. This sort of thing can be illustrated by a recent example.

Last summer, Dr. Teller and three other University of California nuclear physicists informed the Joint Congressional Committee on Atomic Energy that they had "high hopes" of obtaining a virtually clean bomb, but that such a weapon could not be built without tests. Some days later, Admiral Strauss, the head of the A.E.C., took these men to see the President, and they assured him that they *knew* how to make such a clean bomb, when in fact they only *thought they knew,* which is something quite different. But by July 3rd, the President, who is a busy man, had perhaps forgotten just what they told him, and in his press conference of that day he said: "They (these scientists) tell me that already they *are producing* bombs that are practically clean."

You see that a mere "high-hope" in the mind of Dr. Teller, who until lately was a very optimistic man, is in two weeks transformed into *actual production* of clean bombs. To round out this confusing picture, I may add that more than a month later the A.E.C.'s semi-annual report made it plain that not only has there been no such thing as a pure fusion explosion as yet, but that none is even in sight. Even

(Continued on page 33)

ATOMIC RADIATION

from page 4

more disturbing is the guided-missile picture. About two years ago, on Feb. 1, 1956, to be exact, the President told the American people: "You can be sure that in every single defense-field, including guided missiles, we are ahead of anybody else."

How could he have been so wrong? The Russians can't perform miracles; they must have been working on missiles for years. Are we to suppose that our intelligence-service and our military experts did not know this, and if they did know, why wasn't the President, and through him, the country informed?

Now there is no occasion to question the good *intentions* of our government. There can, of course, be circumstances, under which government leaders may feel justified in withholding vital information. But the framers of the American Constitution were convinced by their reading of history, that it is the natural and inevitable tendency of men in authority to withhold information, if in their opinion it is likely to produce a result which they deem undesirable. The Founding Fathers were well aware also of the corrupting influence of power. That is why the Constitution-makers insisted that the people must be informed about everything that concerns them—not as a matter of privilege, but as a matter of natural and inherent right. It is high time that we reasserted that right. For our security policies, with the attendant secrecy, are becoming a contradiction of our basic social aim, *viz.* the growth of freedom. Military superiority would be a dubious advantage if it entailed the loss of that freedom. And when Dr. Libby says in his letter to that great humanitarian Dr. Albert Schweitzer: "We have to choose between the terrible risk of abandoning the defense effort which is so essential under present conditions to the survival of the Free world, against the small controlled risk from weapons-testing," one wonders what kind of a free world can survive in these circumstances.

I have dwelt at some length on this particular aspect of the Atomic Energy problem, because it has an important bearing on all other aspects.

Difficult to Grasp

Turning now to these, it is true, I think, that even the average person realizes we have entered a new age—the Atomic Age. He also realizes vaguely that we are confronted by vast powers of which we have no real understanding. The magnitudes involved are either too incredibly small or too unimaginably large for the mind to grasp. Everything comes either in billions or in billionths.

Again, he has a pretty good hunch that this vast power is probably extremely dangerous. It may produce great benefits, but also irremediable disasters. A high-tension line warms and lights an entire city. It can also kill unfortunate farmers and cattle and airplane passengers who come in contact with it or even just too close to it. But such a powerline is a mere child's toy compared with atomic energy on a large scale. You would have to have a million trucks, each carrying 10 tons of T N T, to pack the same energy as is contained in a single H-bomb. Those trucks would reach 400 times around the earth, spaced 5 to the mile.

Clearly, we simply must find out about this thing and come to grips with it, because very soon now we shall have to make decisions, and whatever they are, they will be irreversible. We have already passed the point of no return.

Some Vital Questions

Now among the thousands of questions that might be asked, what are the most vital ones? In my opinion they are:

1) Must we continue to devise and test a succession of more and more terrible nuclear weapons—A-bombs, H-bombs, rockets, submarines and so on? Will they make us more secure, and in any case, what are the risks we run in testing them?

2) Can a "clean bomb" be made? If it can, what point is there in making it?

3) What are the benefits to be anticipated from the so-called peaceful uses of atomic energy, and what are the dangers involved in its large-scale production by atomic power-plants, scattered all over the earth?

I shall try to answer these questions briefly and at the same time with a reasonable degree of correctness. In doing this I am using the latest data published by the National Research Council and the National Academy of Science.

I may add parenthetically that additional important material from other authoritative sources has just recently been published.

None of it invalidates, but on the contrary strengthens the arguments I am advancing.

Take the first question. As to the first part of it, I find myself in complete agreement with what Mr. George Kennan, our former Ambassador to Russia, said in London on Dec. 2nd: "To me it is a source of amazement that there are people who still see the escape from cataclysmic war in the continued multiplication of the destructiveness and speed of delivery of the major atomic weapons. And as for those frantic schemes for defense against atomic attack I see no ground whatever for confidence in them. I do not trust the calculations on which they are based. But beyond this, what sort of life is it to which these devotees of the weapons-race would condemn us? Are we to flee from one defensive device to another, each more costly and devastating than the one before? If I thought that this was the best the future held for us, I should be tempted to join those who say: 'Let's give up those weapons altogether'."

There are plenty of scientists, engineers and even some military experts, who share Mr. Kennan's views. It seems doubtful, to say the least, that national defense, taken literally, is still a meaningful concept. It used to mean that a nation could survive even a long and bitterly fought war, if it had adequate defenses. Now, if war begins, the H-bombs will begin to fall within 18 minutes, and without any warning. No matter what defense measures are used, some of them will reach their targets, and in the opinion of very knowledgeable engineers who thoroughly understand our vastly complex industrial network, just a few of those bombs can injure any country beyond the possibility of recovery. But setting aside these considerations for the moment—and only actual war can prove them either right or wrong—what about testing? It may be taken for granted that nearly all modern weapons, except those used to spread poison gas or bacterial plagues, will employ nuclear explosives. Just how such explosives are delivered to their target will make little difference to those who are hit by them. In any case, the designers of these weapons insist that they must be tested for effectiveness, and as you know, bomb-tests have been going on more or less frequently for some years, in various parts of the world.

In 1945 nuclear explosives equivalent to 55,000 tons of T N T were detonated, in 1954 a thousand times as much, and in 1957 more than in any previous year. The fact is that these socalled "tests" are, as Norman Cousins put it, slowly transforming the sky above us into an open sewer for radio-active poisons.

No doubt this statement sounds a trifle extreme, so I shall present some evidence to support it.

What Explosion Does

Every nuclear explosion injects into the atmosphere trillions of radio-active particles, besides enormous quantities of heat and radiant energy, such as alpha, beta, gamma-rays, all extremely dangerous. Some of this stuff comes down in the vicinity of the detonation-point, say in an area of some hundreds or thousands of square miles. In this area practically everything is annihilated. Farther out, the effect is not so lethal, but still very destructive. Finally, a large fraction of the material—just *how* large a fraction no one knows—is carried into the upper atmosphere, drifts over the entire earth, and after anywhere from a few months to 10 or 20 years, settles down as an invisible ash on every living thing. It gets into every mouthful of food we eat, into our milk and drinking water, into every bone and tissue of our bodies. This is not mere conjecture but established fact. Within 6 months after the Bikini explosion some 3 million square miles of the Pacific Ocean were contaminated. Three *years* later some of the Marshall Islands, 100 miles away were still too radio-active to occupy. And within a few weeks of an

atomic-bomb test in Nevada, milk in England shows traces of Strontium-90, the most deadly of all artificial radioactive elements. The Swiss Federal Atomic Commission reported on August 17 that nuclear tests have made the rain in Switzerland reach a degree of radioactivity which in their opinion exceeds the permissible limit.

"Yes," says Dr. Libby, the scientific member of the A.E.C., "that is so, but the amount of fall-out is so extremely small that it is completely negligible." Actually, it is estimated that every really big bomb explosion releases about 1,000 pounds of fission products. When this amount is averaged over the whole earth's atmosphere, it does seem quite negligible. Yet it is the equivalent in radioactivity of a billion tons of ordinary radium.

On the other hand, the total amount of the fundamental genetic substance of the entire human race is no greater than a couple of pin-heads. Every mathematician knows that in dealing with very small magnitudes, one must be extremely careful about doing any neglecting, since it may lead to completely false conclusions.

Senator's Position

Senator Hickenlooper of the Joint Congressional Committee goes even further than Libby. He says that weapons-testing involves no risk whatever. The Senator's opinion on this particular question is, of course, not entitled to serious consideration. Nevertheless, he is a government official, and his off-the-cuff pronouncement is a good example of the kind of misinformation of which we get altogether too much.

Just how irresponsible Hickenlooper's claim is, appears from the statement just recently made by Mr. Holifield, the chairman of the Special Radioactivity Subcommittee of the Joint Congressional Committee. He says: "After listening to many eminent experts disagreeing on this subject, I arrived at the conclusion that we need much more scientific knowledge. As a layman I was somewhat shocked to find out how much those experts admitted they did not know. In fact when I thought over how little is known for sure, I wondered how some government officials could be so positive that bomb-tests were so safe."

In any case it is obviously not prudent to ask the same agency, namely the A.E.C., both to develop bombs and also to evaluate the risks of fall-out or of atomic wastes incidental to power production. It cannot serve two conflicting masters. Clearly we are too early in the game for Dr. Libby to know that his assertion about negligibility is true. The weight of the evidence we have and the judgment of hundreds of scientists of the highest integrity and competence is against him.

Fall-out may already have caused a significant increase in deaths from leukemia, bone-cancer and other incurable diseases.

But worst of all are the adverse genetic effects of excessive man-made radiation. By inducing mutations in our genes—and nearly all such mutations are bad—there exists the definite possibility or even probability that the continued tests will eventually produce some millions of defective children over and above those we have now, and we already have far too many. By defective, I mean victims of malformation, neuromuscular diseases, epilepsy, blindness and idiocy. In short, by continuing the tests, we may be seriously impairing the vitality and the fundamental genetic structure of the entire human race. It is true, of course, that our knowledge of human genetics is as yet extemely limited, but for that very reason we ought not to take rash actions which can never be undone. As Claude Bernard, the great French physiologist, observed: the true scientist must always doubt his findings, and when he has no findings, he must refrain from action.

A very common objection to these paticular arguments and one that the A.E.C. keeps harping on, is that whatever radiation hazards may be involved in weapons-testing, they are nothing like as large as the risk we run in the case of dental and medical X-rays, and, so they say, that risk is hardly worth mentioning. Both assertions are unproved and I do not think a conscientious scientist would or should make them. As to medical and dental X-rays we know quite definitely that their improper and indiscriminate use is by no means harmless. Radiologists, technicians, dentists and others who daily work with even the best-shielded apparatus, have their life-span shortened on the average by six years. Their children show a significantly higher incidence of defect.

Panel Cites Hazards

At its October 2 meeting in Baltimore, the American Roentgen Ray Society's panel on radiation hazards, declared: Among geneticists there is now general agreement that while X-rays are an extremely valuable medical aid, they *can* cause harm, particularly in producing abnormal hereditary changes in future generations, and all radiologists and dentists are urged to reduce X-ray exposures to the lowest practical amount. These experts estimate that the present medical radiation level will in 30 years result in the birth of 8,000 children annually, with various degrees of defect, or 10% of the present annual number of such births resulting from natural mutations.

In conclusion they stated: Medical and dental radiation exposures must be considerably reduced if the development of atomic energy for power and other peaceful purposes is to proceed without serious danger of exceeding a safe limit.

We may well ask ourselves whether there can possibly be any advantage that is worth so great a price. Still, if our bare survival depended upon further tests, we would undoubtedly make them. But what are the facts? General Norstad, the commander of the NATO forces, told Congress some time ago that we have enough bombs in stock to wipe out Soviet Russia. The destructive power of the present bombs, of which we possess an estimated 30,000, is so cataclysmic that the President himself has denied any practical point in making bigger ones.

Destructive Capacities

Military experts are, or rather were, until recently, agreed that both Russia and the U. S. now have the necessary atomic stockpile and the delivery capacity which will enable us to destroy 80% of the Soviet Union, while Russia can destroy 50% of the U. S. To be sure, at the moment the American people are, if we can believe the newspapers, fearful that because of Russia's alleged ability to destroy our air-bases and strategic bomber-fleet in short order with long-range missiles, we have lost all means of retaliation. I do not believe this for an instant. Besides, there seems to be no good reason to think that Russia intends to attack us any time soon. After all, why should she? Is she not gaining her objectives by less risky means, in the Middle East, in Africa, and in the Far East? By constantly stirring up trouble among the hungry, ignorant and impatient populations of the underdeveloped countries, she can involve us in endless crises, without firing a shot.

So we shall probably have time to catch up in guided missiles, but for reasons I indicated earlier, I don't see how that will improve our situation for very long.

Now for the second point. A "clean" bomb is just as much a contradiction in terms as an honest thief, and one is no more credible than the other.

It is theoretically true, that by replacing the uranium jacket of the present H-bombs by tritium, or hydrogen 3, the amount of radio-active debris can presumably be greatly diminished, though the resulting bomb would be considerably less powerful and much more costly. However, it must be repeated that the radioactivity resulting from nuclear explosions has not been, and in all probability cannot be, conquered. There will always, in the nature of the case, be a terrific burst of initial radiation.

If the explosion is close to, or on the earth's surface, or beneath it, large quantities of rock, dust and water will be sucked up into the atomic cloud and deposited as contaminated, radioactive particles.

The kind and extent of contamination would depend, so the A.E.C. report says, on a combination of circumstances associated with the energy yield and design of the bomb, the height of the explosion, the nature of the surface beneath the point of burst, and meteorological conditions.

In plain language, this amounts to saying that we really don't know very much about the long-term and long-

range effects of nuclear explosions. Even from the technical standpoint then, there is no such thing as a clean bomb, nor is there likely to be. No foreseeable scientific development can eliminate the instantaneous burst of deadly radioactivity, nor can it eliminate the residual fallout entirely.

I should like now to dwell for a moment on another aspect of this business, which in the end is probably more important than the technical one.

When we talk of "clean" bombs, we are no longer talking like sane people, but like madmen.

To call a device "clean" that in the twinkling of an eye will reduce to ashes millions of live women and children, and men just like you and me, and condemn countless others to a lingering but no less certain death, is to make a monstrous mockery of words. It is likewise an abuse of words, when Mr. Churchill says: "It is to the universality of potential destruction that we may look with hope and even confidence."

Hope indeed! Sir Winston is, of course, on the side of humanity and of reason, but he must know better than anyone else, that the prospect of unlimited catastrophe has never restrained men drunk with power and blind with hate.

We turn all moral values upside down when we pray for peace while at the same time we prepare for mass murder. If that is the way it has to be, let us at least be as candid as old General Sherman and quit the double-talk about cleanliness. Hypocrisy makes a nasty business even worse.

But even from the purely practical standpoint, the whole effort to produce these weapons makes little sense. For if we succeeded in making really "clean" bombs, that would be just fine for the Russians. They would then use their "dirty" bombs on us with much greater destructive effect than we could achieve by dropping our clean bombs on them. And if both sides *can* agree to use only clean bombs, they can also, and with infinitely better reason, agree to use no bombs at all. In the end they will have to do that anyhow or commit mutual suicide.

The leaders of the great powers solemnly affirmed at the Summit conference in Geneva that nuclear war can no longer be regarded as a rational instrument of national policy. Yet their foreign offices and military planners appear not to believe this. They go on building more and more destructive weapons, each apparently hoping to hold the "balance of terror" over the others. In fact, the A.E.C. through Dr. Libby, maintains that we cannot stop until we have the *ultimate* nuclear weapon. Presumably, this is one that will blow the whole earth to pieces, and to be logically consistent, we have to test it to see if it will work! This is the sort of madness to which we are exposed whenever we place too much power in the hands of a few men.

The arguments, here set forth, seem so conclusive that last April, the 27 top scientists of Germany, including many Nobel prize winners and men of world-wide fame, among them Otto Hahn himself, publicly declared that they would never again take part in any way in the production, testing, or application of atomic weapons. Come what may, they would refuse to be accomplices in a vast atrocity which threatens the world with overwhelming disaster.

So much for the military use of atomic energy. What about the peace-time uses?

We all know that artificial radioactive substances, the various isotopes of cobalt, iodine and so on, especially those that decay rapidly, have already proved to be very valuable in medical research and therapy. Other beneficial uses will undoubtedly come to light as research progresses. We are only at the beginnings of these things.

But it is atomic energy as a source of power that is of the highest importance.

The world's population is increasing at a fantastic rate. It is doubling every hundred years, and we are within sight

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AROUND THE UNIVERSITY, from page 5

The Curators of the University have awarded contracts for additional construction totaling more than $1,300,000 for the Columbia campus. The approved contracts include the new Electrical Engineering Building, the new Athletic Dressing Room Building, and alterations to the old Parker Hospital Building.

Dr. Owen A. Kearns of Monrovia, Calif., who is at present taking post-graduate work at the University of California, has been appointed Medical Director of the State Crippled Children's Service and associate professor of preventive medicine and public health at the University. His appointment becomes effective July 1. As Director of the Crippled Children's Service he replaces Dr. Frederic E. Simpson who resigned several weeks ago. Dr. Kearns is a native of Utah and took his A.B. and A.M. degrees at the University of Utah with pre-medical work majoring in bacteriology and pathology. He then received M.B. and M.D. degrees from Northwestern, the latter in 1940.

The Curators of the University have approved preliminary plans and specifications for a mall to extend south from the corner of Ninth Street and Conley Avenue to the New Medical Center at the south edge of the campus. President Ellis said the Board has instructed the architects, Hellmuth, Obata & Kassabaum of St. Louis, to proceed with complete plans and specifications for the project. The preliminary plans provide two eight-foot sidewalks divided by a landscaped area 24 feet wide extending from Conley Avenue to a patio to be built near the entrance to the Medical Sciences Building. There will be only a grade crossing where the mall crosses Rollins Street.

The University 1958-59 academic year for the divisions at Columbia opens at 8 a. m. Sept. 15 and closes with Summer Session Commencement at 8 p. m. Aug. 7, according to the official University calendar just released.

New Student Orientation opens at 8 a. m. Sept. 15, with the Convocation for all New Students at 7 p. m. the same day. Registration begins at 1 p. m. Sept. 16 and closes at 5 p. m. Sept. 17. Classwork starts at 7:40 a. m. Sept. 18.

Saturday, Oct. 11, is New Students Parents' Day. The Thanksgiving holidays begin at 12:30 p. m. Nov. 26 and end at 7:40 a. m. Dec. 1. The Christmas vacation is from 12:30 p. m. Dec. 20 to 7:40 a. m. Jan. 5. Final examinations will begin Jan. 24, and the semester will close at 5 p. m. Jan. 31.

The second semester opens with registration at 8 a. m. Feb. 3. Classes will begin at 7:40 a. m. Feb. 5, and the spring recess will be held from 12:30 p. m. March 26 to 7:40 a. m. March 31.

Final examinations begin May 30. Baccalaureate exercises will be Sunday, June 7. The second semester ends at 5 p. m. June 6, with Commencement June 9.