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ITEM VOID

CODE No. 27-31

# Explosives Laboratory opens its doors.

New Scientist

20 June 1968.

pulsars. Previously, Sir Martin had tentatively identified pulsar CP 1919 with a weak blue star. At the Goddard meeting two independent researchers reported detecting periodic fluctuations in the light intensity from this source. One was Dr David Cudaback of California University, working with a team at the Lick Observatory; the other Dr Steven Maran of Kitt Peak National Observatory (*New Scientist*, Vol.38, p.446). The light was extremely faint, and careful statistical techniques were called for in the search for periodicities.

The odd thing about the results from these two observatories was that though the light seemed to be varying by some four per cent of its strength it was doing so at only half the frequency of the radio emissions.

Dr Cudaback, however, has now retracted his statement, saying that the Lick Observatory conclusion was entirely spurious, the result of undetected "wow" in the tape-recorder used. The experiment demanded lengthy recording of electronic observations of the star, followed by a computer search of the tapes for signs of the likely periodicity. "Wow" is simply an inherent periodicity in a faulty tape-recorder.

After some 20 hours of observing time, however, the Kitt Peak astronomers are still convinced that the pulsar optical fluctuations are real; though some 14 hours' work on the 200-inch reflector at Mount Palomar have given a negative result. It certainly seems hard to explain an optical rate of half the radio periodicity.

## Explosives laboratory opens its doors

With a set-piece that showered visiting photographers with water, the Explosives Research and Development Establishment last week made the point that some of its most interesting research concerned underwater explosions. The occasion was the first ever open day of the establishment, near Waltham Abbey, in Essex. The origins of this ancient facility are, to quote the guidebook, "largely a matter of conjecture and legend," but the abbey was certainly known for gunpowder as far back as 1561. Current work is more concerned with rocket propellants than explosives, and perhaps a third of the effort relates directly to neither. For example, the search for a strong material for rocket cases has given rise to a study of fibre-reinforced metals and plastics which has now taken off under its own power (as it were), to become one of the main reasons why ERDE (now taken over by the Ministry of Technology) should be known about by industry.

But within the field of explosives, there is still progress to be made in the design of substances that will have the greatest possible impact under water. These are not necessarily just the most powerful explosives. While the amount of energy released per gramme of explosive remains important, it would appear that the "impulse"—which depends on the rate at which the energy is released—may be equally so. Very often, the greatest effect is obtained in water not with a bang but a "heave". The same will probably be true of the materials that will be needed when undersea continental shelves begin to be mined.

So, with the ultimate aim of being able to supply an explosive tailored to a particular need, an arrangement for exactly measuring underwater explosions has been set up at ERDE. An immersed piezoelectric pressure sensor records the pattern of the shock-wave in quite fine detail, from which the effective energy and impulse of the "bomb" can be deduced. It is hoped that a reproducible standard technique will be arrived at along these lines. It was this system that was demonstrated last week for the not unmixed benefit of the cameramen.

Making new explosive mixtures for testing —the other end of this type of research—remains the same sort of risky business it has been ever since Chinese Taoist monks, around AD 900, burned their beards discovering gunpowder. An impressive remote-handling plant has been completed recently at ERDE, incorporating a five-inch gauge model railway. The experimental oxidizers, fuels and binders (binders, separating and protecting the constituents, are under particularly active research) are wheeled to the mixer, mixed in vacuum, moulded, cured, and packed into test "rounds", trundled across a field to one of a range of enclosures, and exploded, all behind a sufficient thickness of concrete to stand up to the accidental detonation of 15lb of TNT.

This figure defines the capacity of the plant: that is, on the borderline between the laboratory scale and the manufacturing scale. It is thus not only a remotely controlled laboratory, but in fact a small-scale trial production rig, which can simply be scaled up to provide the designer of a production line with most of the data he needs.


## How fallible can you get?

Last week Professors Lew Kowarski and Francis Perrin, two pioneers of nuclear research, were in Washington for the presentation of a special $35 000 prize by the US Atomic Energy Commission's chairman Glenn T. Seaborg. The prize was awarded in recognition of the outstanding contribution made to the development of nuclear energy by themselves and two other scientists (now dead), Frédéric Joliot and Hans Halban. Yet in April 1951 the same Lew Kowarski, at that time in charge of the physics division of the French Atomic Energy Commission, was quoted as saying: "In 1975 atomic power may become a practical running possibility, but not until AD 2000 is it likely to challenge classical methods and then only if the power stations are on an international scale." Sir John Cockcroft said, at the same time, "One major difficulty bedevils the work of the nuclear engineer—the radioactivity which is produced along with the development of heat. Safe disposal or storage may prove to be costly and difficult".

Forecasting the future is a chancy busi and forecasting the future of science and te nology is possibly the chanciest. The rema were made in an article on the future of nucl power in the now dead magazine, *Picture P* It is extraordinary to read now, less than years on into the future that the scientists w trying to penetrate. The Russians and Am cans fared no better. According to the arti Professor Peter Kapitza believed then t atomic energy would not become a factor peacetime application for 50 to 100 years. Lawrence Hafstad, in charge of reactor velopment for the US Atomic Energy C mission, is quoted as saying that nuclear po would cost "a megabuck per megawatt".

The more positive a statement made ab the future, the more it seems to be shaky. example, the article breaks into italics to phasize this. *"There is no question that idea of producing a few immense atomic po plants to supply large districts or even w countries is a dream not likely to be reali until the next century."* The whole of hur activity proves, almost without exception, something about which there is no questio going to be questioned and usually in f short order. The paradox about such pron cements is that they may, and usually made by scientists (when they are not mad politicians), who, by their nature and trai are questioning and cautious. Rutherford's viction that there was no possible prac value in atomic research is well known.

The points in the *Picture Post* article w of course, made honestly on the basis of information available at that time. Som them, too, are palpable hits. "There seems t little point in considering atomic fuel for liners yet, since other fuels are plentiful atom-driven ships would certainly have t specially designed and would have no g advantage over present vessels and their ling would be prohibitive." There goes *Savannah*. But the general wrongness of casting by people in the know is astonis Enrico Fermi, also quoted, says, "I believe it is very desirable that the public should thinking that atomic power is round the co because, if they do so, they are in disillusionment. I believe that it would great disservice to engender unjustif hopes."

Obviously, there was great pessimism a nuclear energy's future because the terr bombs on Japan had bitten deep. But this proves that past events cast much more tectable shadows than coming ones.

## New mining complex to surpass Magnetogorsk

The region of the Kursk magnetic anomaly, estimated iron ore deposits of thousand millions of tons, is due to be developed into largest ore mining centre in the Soviet U according to a recent TASS report from cow. It is to be far larger than the fam Magnetogorsk complex in the Urals, which built up from nothing in the 1930s.

The Kursk anomaly is situated in Ce