Legal shadow over laser patent

First court verdict for Gould claims

Washington

The simmering debate over who should be credited with the invention of the laser entered a new phase last week when a federal judge in San Francisco, spurred on by a New York technology investment company, upheld a patent issued to physicist Dr Gordon Gould as taking precedence over the original patent issued to Dr Charles Townes and Dr Arthur Schawlow in 1960.

Dr Townes shared the Nobel prize, with two Soviet physicists, in 1964 for his work in quantum electronics and microwave spectroscopy leading to the development of the laser or Light Amplification by Stimulated Emission of Radiation. Dr Schawlow shared the Nobel prize for his work as a chemist in the same area last year. Both are generally credited with putting forward the first conceptual design for a laser in a scientific paper published in *Physical Review* in December 1958 (**112**, 1940; 1958).

Dr Gould, however, who worked a few doors away from Dr Townes's laboratory at Columbia University in New York in 1957, claims that a notebook kept at the time demonstrates that he was the one to coin the word laser. He also claims that his conception, as described by his investment company backer, was that of an amplifying device, and should thus entitle him to credit for the conception of the laser as a whole.

It could not be established on Monday whether Dr Gould's claim extends to the basic process by which photons are amplified within a laser or to some other feature of the device. The substance of the claim appears to be the notion of creating a population of excited atoms, capable of stimulated emission, by exposing a gas or other material to an intense flash of light.

Dr Gould's claims for patent rights extending to an estimated 25–35 per cent of all lasers on the market, have been vigorously pursued by a New York-based company Refac Technology Development. With another company, Patlex of Pennsylvania, Refac has bought 80 per cent of any royalties generated by Dr Gould's patent for a sum claimed to be over $2 million, and says it is now defending his claims to the laser against those of the scientific and technical establishment.

Until last week, the courts had been relatively unsympathetic. Dr Gould has failed several times to have revoked the patent granted to Townes and Schawlow in 1960, when both were working at Bell Laboratories, on the grounds that he had been the first to conceive a complete working laser.

In 1977, however, the US Patent Office awarded Dr Gould a patent on his claim to have designed the amplifying device referred to in the patent. Since then, Refac has sought to obtain royalties from all companies producing optically-pumped lasers, and says that on the basis of a 1979 patent, also granted to Gould, it will now seek royalties on the use of such lasers.

Last week's decision, the first time that the validity of the patent has been tested in a federal court, was based on a suit filed by Refac against the Palo Alto-based company General Photonics claiming infringement of Gould's patent rights and demanding royalties on all lasers produced by the company since 1977.

Refac claims that Dr Gould should have received the technical — if not the scientific — credit for the first laser. The arguments convinced Judge Samuel Conti and, as a result of his ruling in favour of Refac, General Photonics has agreed to pay the company 8 per cent of all its future sales.

Dr Arthur Schawlow, now professor of physics at Stanford University, has said that the US Patent Office was wrong to issue Dr Gould with the 1977 patent, and that Dr Townes "may have told Gould what he was doing" during conversations at Columbia in 1958. Dr Shawlow also says that drafts of the subsequent *Physical Review* paper were already circulating in the laboratory in August 1958, the date on which Gould wrote down some of his ideas.

Mr E.M. Lang, president of Refac, argues conversely that Gould spoke to Townes about his ideas on how to produce an amplifier that would make the laser work, and that it was Gould's ideas which were later incorporated into early laser designs for which Townes and Schawlow

UN university goes on tour

Paris, February

Global modellers, the inheritors of those who gave us *The Limits to Growth* in 1972, gathered here from 22 to 25 February to advise the Tokyo-based United Nations University on its preoccupation with the problems of agriculture, energy and development. The symposium, organized by Professor Maurice Lévy of the Marie and Pierre Curie University (otherwise Paris VI), seems not finally to have persuaded the university to take global modelling to its bosom, but the rector, the Indonesian Soedjatmako, and his four vice-rectors undertook to brood about the problem when they are back in Tokyo.

Part of the interest of the occasion was that it showed how stimulating modelling techniques of socio-economic problems have proved to be, if only as a spur to understanding how one variable is related to another. Thus a model of the rural economy of Bangladesh was widely acclaimed, but the work of the International Institute for Applied Systems Analysis, of the Organization for Economic Cooperation and Development and of Dr Sam Cole (University of Sussex) also received high marks.

Professor Donella Meadows, who has been working on a model of the rural economy of New England since her collaboration on the original Club of Rome report, argued passionately at the symposium for a kind of global network of global modellers, linked together by communications satellites and thus able to exchange information or computational codes easily. The United Nations University cautiously withheld its blessing.

One of the problems of such occasions is that the participants are in two camps — those who would construct models that address some tangible aspect of a problem and those who hold that complexity is of the essence. Some of the most confusing (and energetic) contributions to the discussion came from those who argued that "techno-economic" models purporting to account for, say, the effects of fuel prices on food production, were certain to be inadequate, given their neglect of "socio-political" considerations.

The interest of the United Nations University in these studies stems from its wish partially to focus its interest on the encouragement of economic development on what the symposium called "the energy-agriculture nexus". Inevitably, in a gathering of systems analysts, some argued that "food" would be a better variable than "agriculture".

The United Nations University is not so much a university as the late U Thant's creation of a United Nations development agency. Its chief source of funds is a pledge of $100 million from the government of Japan. The university has no students, while all its employees are on short-term contracts. According to Soedjatmako, negotiations are now under way for a permanent building in Tokyo, although this is unlikely to be built before the end of his term of office in 1985.

Lacking a permanent establishment, the university works chiefly by forming links with academic groups elsewhere, in industrialized and developing countries alike. It was encouraged, at the end of its four-day stand in Paris last month, to be told by the newly created minister of external affairs at the French Department of Education that French academics will be asked to collaborate with the university. ●

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had been awarded the patent.

The scientific record is sufficiently ambiguous to allow for conflicting interpretations of the facts. Lang argues that the details of a proposed amplifier included in the *Physical Review* paper and the subsequent patent were shown not to work, and that Gould's ideas should therefore take precedence. Schawlow's response is that the existence of a working amplifier was implied in the paper, and that even though the specific solution suggested did not succeed, other lines of approach were suggested which proved successful. He also maintains that ideas about possible amplifiers were part of the "state of the art" at the time, and hence not eligible for patent protection on behalf of any one individual.

Refac is using last week's decision to bolster its claims on behalf of Gould. Its share price rose 12 per cent in value after the verdict had been announced. However, others are unconvinced; Dr Schawlow says that the case was poorly defended by General Photonics, which has already admitted that it does not have the money to mount an appeal.

More telling is likely to be a separate suit filed by Refac against Control Laser of Florida, a leading manufacturer of optical lasers. This suit was filed within a few days of the patent being granted in 1977, and has already attracted wide interest from other manufacturers (who once intended to join the suit in opposition to Refac, but then decided to withdraw for fear of being challenged on anti-trust grounds).

When the Control Laser case comes to trial, the company stands to lose a considerable amount of money if the verdict goes against it. Mr Robert van Roijen, the company's president, said last week that the major point of dispute was whether Refac's 1977 patent covered merely the optically-pumped amplifier described in the patent application, or whether — as Refac claimed — the patent could be taken to cover the whole apparatus.

Mr van Roijen would be willing to pay royalties on the amplifier, but denies that a laser patent is involved because "it would cost only a few thousand dollars". His arguments are expected to be backed by Dr T.H. Maiman, a director of Control Laser, who was the first to publish details of a working model of the laser (*Nature* **187**, 493; 1960).

Looming on the horizon, however, is another suit which Refac has filed against a separate company for infringement of the "use" patent; in this case, General Motors has joined the proceedings on the side of the defendant.

Refac continues to characterize such disputes as a David-and-Goliath conflict. The companies maintain that Refac is using Gould's research to support a position that has been consistently rejected by the courts, and that the San Francisco verdict was, in Mr van Roijen's words, a "travesty" that is unlikely to survive the next legal round. **David Dickson**

Pest research centres

Foreign labs shut

New Delhi

Accusations that the big powers conduct espionage or militarily oriented research under the guise of science collaboration in developing countries have again surfaced in the wake of the recent expulsion of an American scientist, Dr David R. Nalin, from Pakistan. The expulsion followed allegations that the United States aided Pakistan Medical Research Centre (PMRC) in Lahore which he headed was engaged in research on the use of mosquitoes in germ warfare. Six years ago another US funded mosquito control project in India was closed down by the government following similar allegations.

Dr Nalin denies the charge. In an interview he said the allegation was part of a Soviet smear campaign against the United States in retaliation against American accusations that the Soviet Union had indulged in germ warfare using mycotoxins in Kampuchea. Dr Nalin claims that his centre was infiltrated by left-wingers who organized strikes and spread rumours of a connection between PMRC and the Central Intelligence Agency. Nalin said that one member of his staff had been shown to have Soviet connections. He said that a Russian, Iona Andronov, who was found one day in the centre, turned out to be a reporter for the Soviet magazine *Literaturnya Gazeta* which "exposed" the centre in an article that was picked up by the world press.

There is some evidence that there were doubts in government circles in Pakistan over Nalin's centre even before the latest accusation of impropriety. Knowledgeable medical sources in India say that Pakistani scientists have been unhappy about PMRC for quite some time. It seems that Nalin's centre had been warned not to open a phial of Japanese encephalitis virus that had been brought for an experiment when it was well known that the disease does not occur in Pakistan.

Nalin admits that his centre had been engaged in work on Japanese encephalitis, but says that the work stopped some time ago. He denies that the unit ever handled genetically manipulated strains of *Aedes aegypti* mosquitoes as alleged by the Soviet press. Nalin said the centre's work was mainly on two species of *Anopheles* mosquitoes that carry malaria, a major problem in Pakistan. According to Nalin, PMRC had conducted pilot studies on control of the malarial mosquitoes by the release of sterile males and had developed an efficient way of sexing the mosquitoes to make the technique effective.

Nalin is associate professor of international health at the University of Maryland, which set up the medical centre in Lahore in 1961. Before becoming director of PMRC, Nalin worked on diarrhoeal diseases in Bangladesh at another United States funded unit run by Johns Hopkins University. That unit was expelled from India in 1975 following uproar in parliament about its activities in Calcutta. Among the reasons for its expulsion were its link with the US biological warfare laboratory in Fort Detrick and the US Navy and the fact that its American staff made frequent trips to India's border areas.

According to Nalin there is a similarity between the allegations of germ warfare that led to his expulsion from Pakistan and those raised in the Indian parliament in 1975. The Indian unit was said to be engaged in the release of genetically manipulated strains of *Aedes aegypti,* the vector of yellow fever which does not exist in India. The experiments to control a vector of a non-indigenous disease raised a furore and the parliamentary committee alleged that the US experiments were part of a programme to develop yellow fever as a germ warfare weapon. The Indian government closed down the New Delhi research unit despite protests from the World Health Organization (WHO) under whose aegis it was set up.

Nalin is not the first American scientist to have been expelled from the Indian subcontinent. Dr Carl Taylor, head of the Division of International Health at Johns Hopkins University, has been told by the

Expulsion denied

Washington

The Pakistani embassy in Washington denied last week that Dr Nalin had been expelled from the country because of the allegation over his involvement in bacteriological warfare research.

The Minister of Information at the embassy, Mr M.I. Butt, said that it had been decided not to renew Dr Nalin's two-year contract as director of the Medical Research Center in Lahore after it expired last August because of what he described as Dr Nalin's failure to stick to procedural requirements for administration and research, and tension with other members of the centre's staff which eventually led several of them to resign. However he added that Dr Nalin had been allowed to stay in Pakistan until the end of January in order to complete a report on his research.

Dr Nalin, speaking from the University of Maryland, said that the future of the research centre was now uncertain, since applications for renewed funding from the Agency for International Development and the National Institutes of Health had been disrupted by his departure. He also said that the head of the department, Dr R.H. Baker, was expected to take over the temporary running of the centre until its future had been decided.

David Dickson

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